Syntax

some syntactically pleasing headlines:
Miners Refuse To Work After Death
Enraged Cow Injured Farmer With Axe
Squad Helps Dog Bite Victim
Two Sisters Reunited After 18 Years In Checkout Counter
British Left Waffles On Falkland Islands
Lansing Residents Can Drop Off Trees
Ban On Soliciting Dead In Trotwood
Kids Make Nutritious Snacks

I will tickle the child with the feather

I will tickle the child with the feather

IP--> NP I VP
NP--> (Det) (Adj) N (PP)
VP--> V (NP) (PP)
PP--> P (NP)

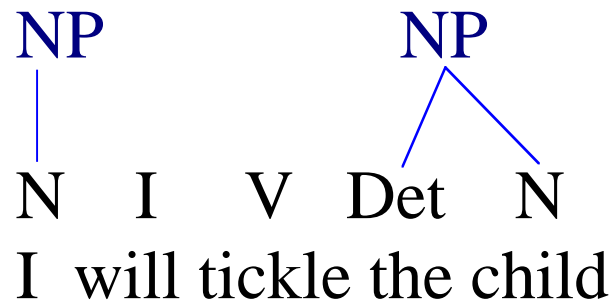N   I   V   Det   N
I will tickle the child

I will tickle the child with the feather

IP--> NP I VP

NP--> (Det) (Adj) N (PP)

VP--> V (NP) (PP)

PP--> P (NP)

```
NP              NP
 |             / \
 N   I   V  Det   N
 I  will tickle the child
```

I will tickle the child with the feather

IP--> NP I VP

NP--> (Det) (Adj) N (PP)

VP--> V (NP) (PP)

PP--> P (NP)

```
              VP
             /  \
   NP           NP
   |           /  \
   N   I   V  Det   N
   I  will tickle the child
```

I will tickle the child with the feather

IP--> NP I VP

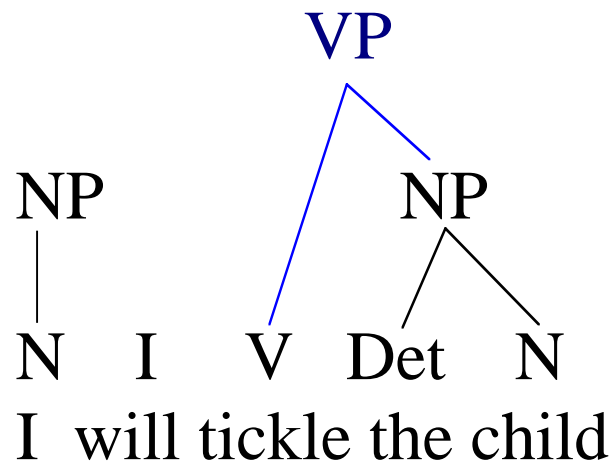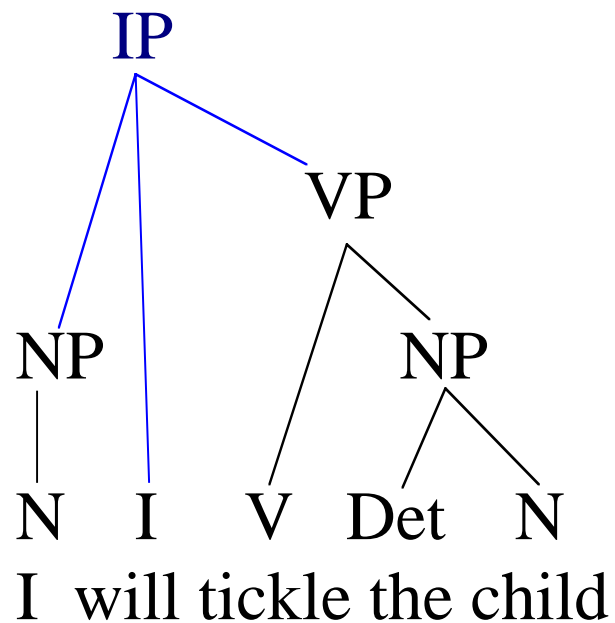NP--> (Det) (Adj) N (PP)

VP--> V (NP) (PP)

PP--> P (NP)


```
              IP
            / |  \
          /   |    \
        /     |      VP
       /      |     /  \
      /       |    /     \
     NP       |   /       NP
     |        |  /       /  \
     |        | /       /     \
     N    I   V    Det    N
     I   will tickle the  child
```

I will tickle the child __with the feather__

IP--> NP I VP

NP--> (Det) (Adj) N (__PP__)

VP--> V (NP) (__PP__)

PP--> P (NP)

```
          IP
         /|\
        / | \
       /  |  \
      /   |   VP
     /    |   /\
    /     |  /  \
   NP     | /    NP
   |      |/    /\
   |      V    /  \
   N   I  V  Det   N
   I  will tickle the child
```
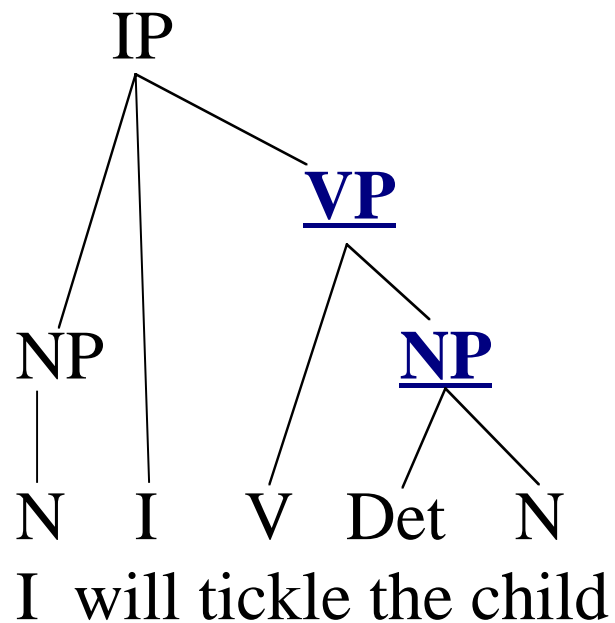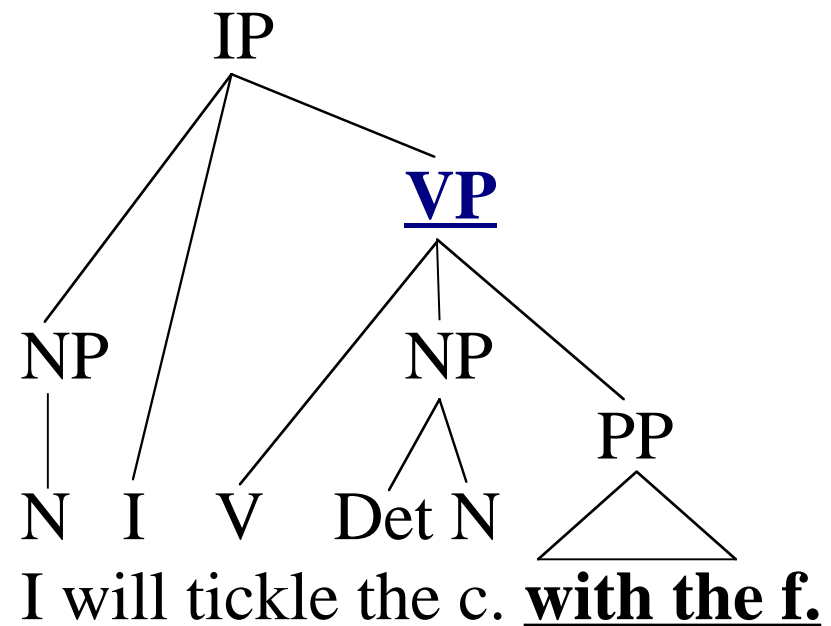
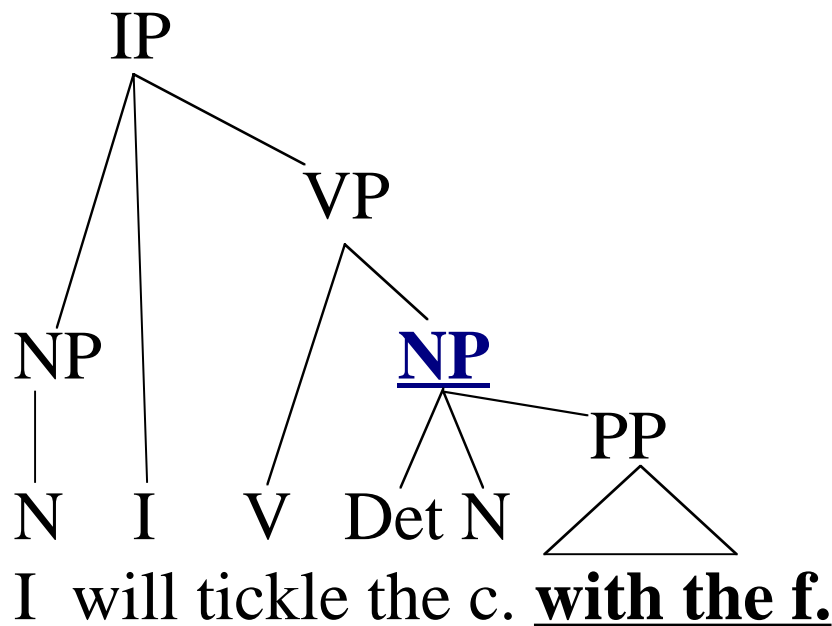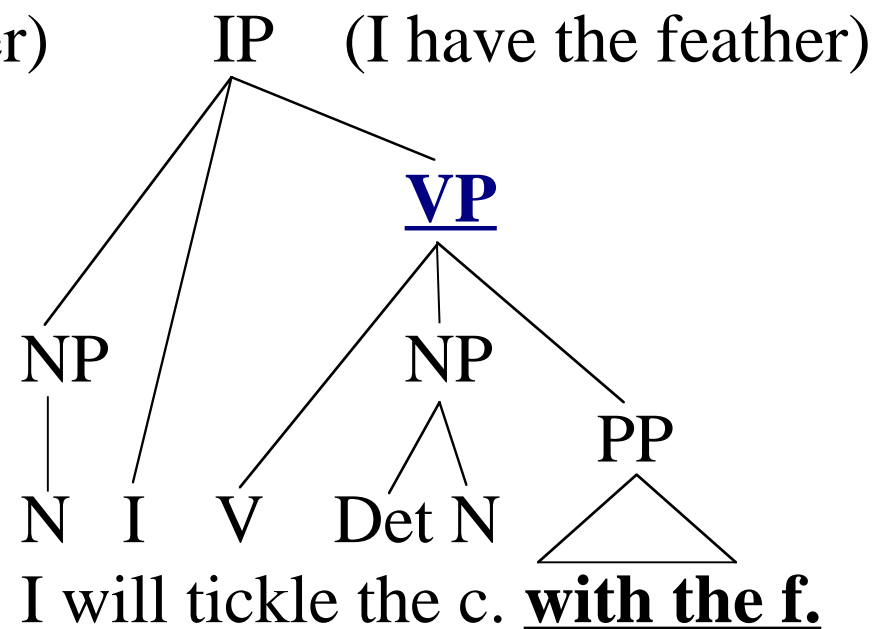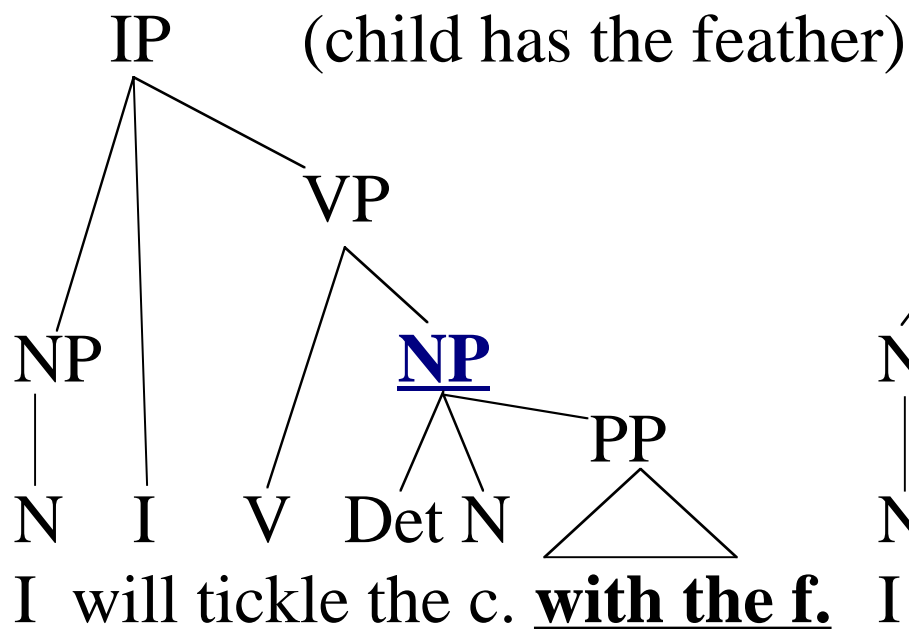# I will tickle the child __with the feather__

IP--> NP I VP

NP--> (Det) (Adj) N (__PP__)

VP--> V (NP) (__PP__)

PP--> P (NP)

I will tickle the child __with the feather__

IP--> NP I VP

NP--> (Det) (Adj) N (**PP**)

VP--> V (NP) (**PP**)

PP--> P (NP)

IP   (child has the feather)   IP   (I have the feather)

VP   **VP**

NP   **NP**   NP   NP

                    PP   PP

N   I   V   Det N   N I   V   Det N

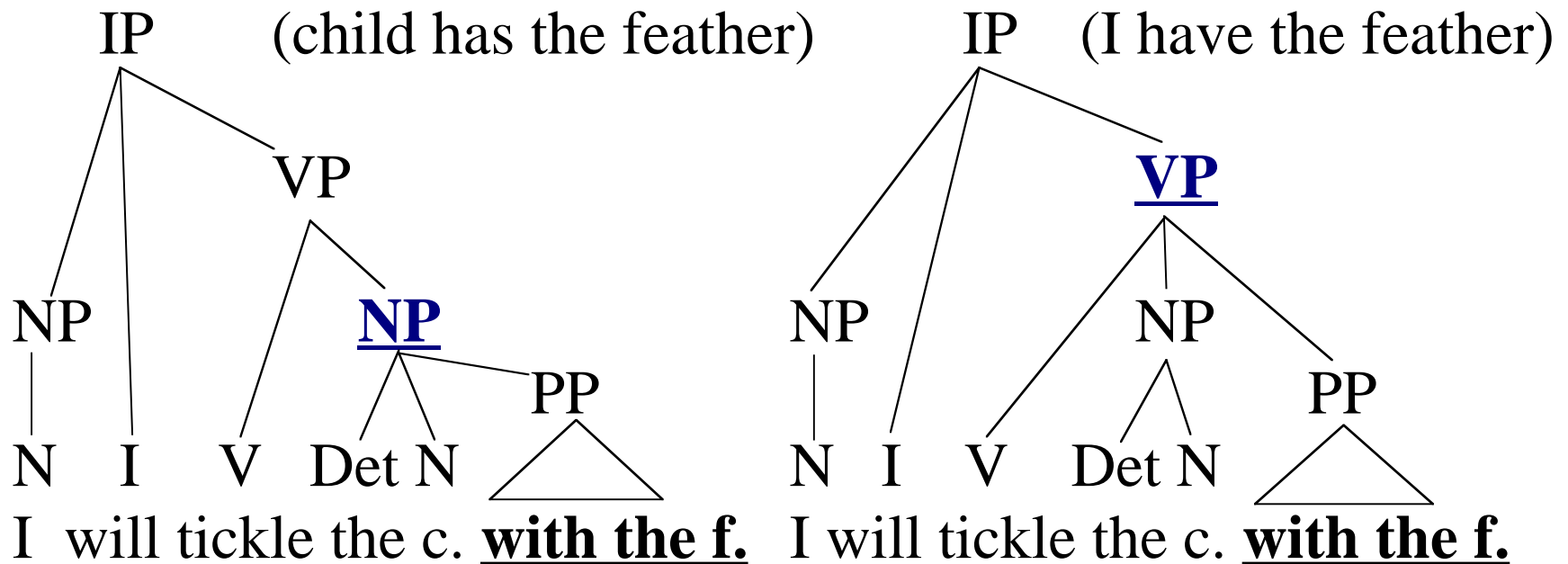I will tickle the c. __with the f.__   I will tickle the c. __with the f.__

I will tickle the child **with the feather**

the child with the feather, I will tickle

the child, I will tickle with the feather

```
        IP        (child has the feather)           IP    (I have the feather)
                       VP                                      VP
   NP              NP                        NP             NP
          |      /    \                  |          /   \
   N   I   V   Det N      PP        N   I   V   Det  N       PP
   I  will tickle the c. with the f.   I will tickle the c. with the f.
```

terminology break:

- Det, N, and PP are **sisters**

```
              IP
            /    \
           /      VP
          /      /   \
         NP     /     NP
         |     /     /   \
         |    /     /    PP
         N   I   V  Det N  /\
         I  will tickle the c. with the f.
```
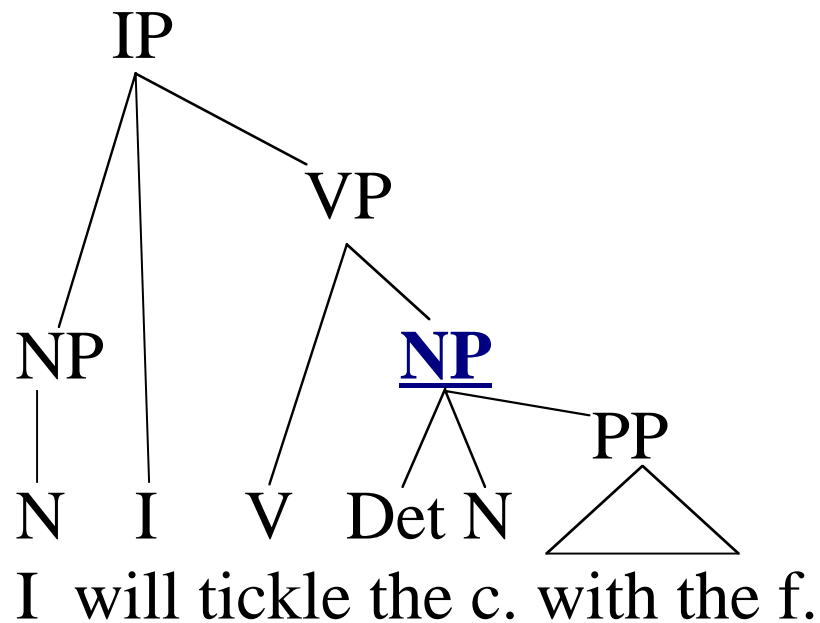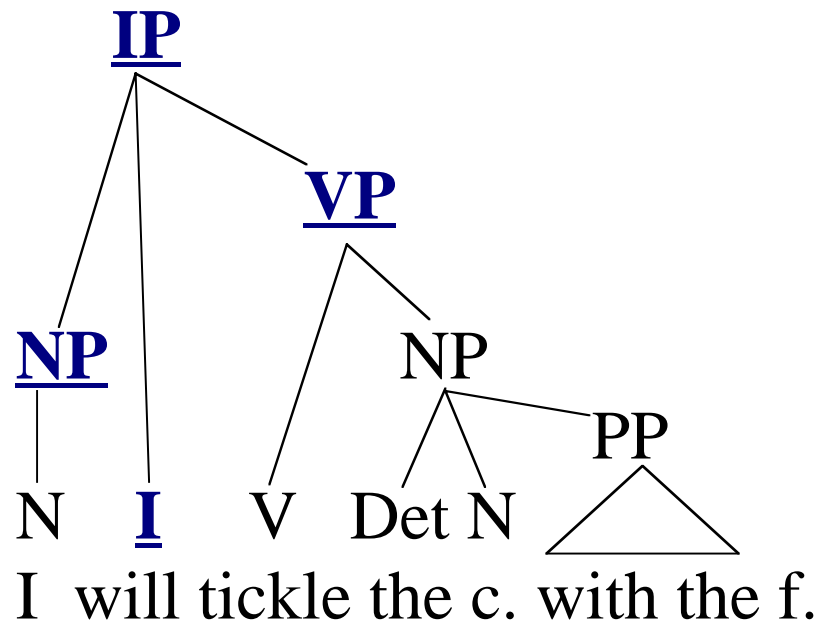
terminology break:
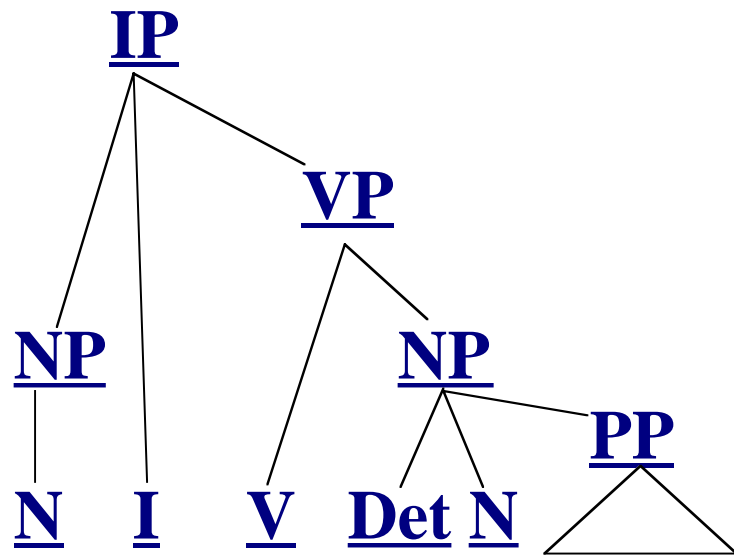
- Det, N, and PP are **sisters**
- NP is the **mother** of Det, N, and PP


```
                    IP
                   /  \
                  /    \
                 /      VP
                /      /  \
               /      /    \
              NP     NP     PP
              |     / \    /\
              N  I V Det N /  \
              I will tickle the c. with the f.
```

terminology break:

- Det, N, and PP are **sisters**
- NP is the **mother** of Det, N, and PP
- IP **immediately dominates** NP, I, and VP

```
              IP
           /      \
          /        VP
         /        /   \
       NP        /     NP
        |       /     /  \
        |      /     /    \ PP
        N   I  V   Det  N  /\
        I  will tickle the c. with the f.
```

terminology break:

- Det, N, and PP are **sisters**
- NP is the **mother** of Det, N, and PP
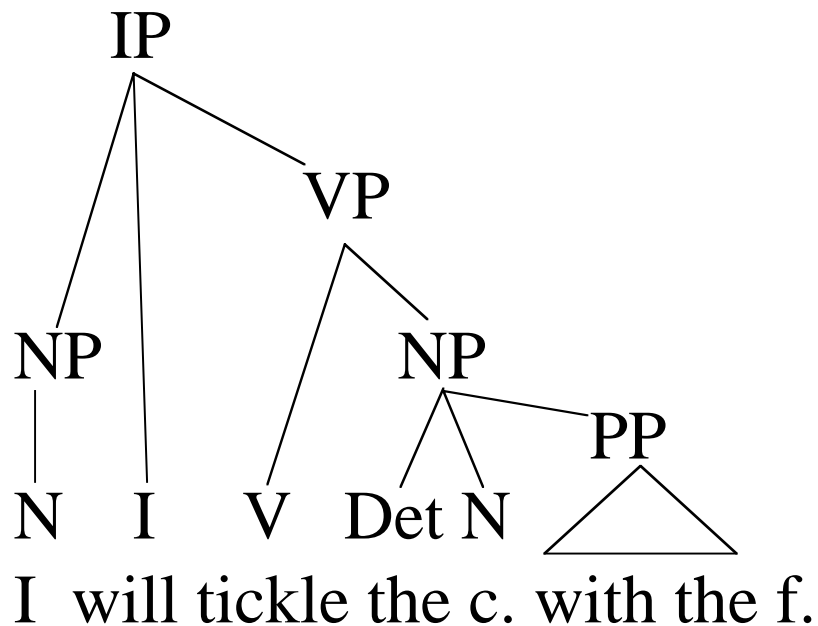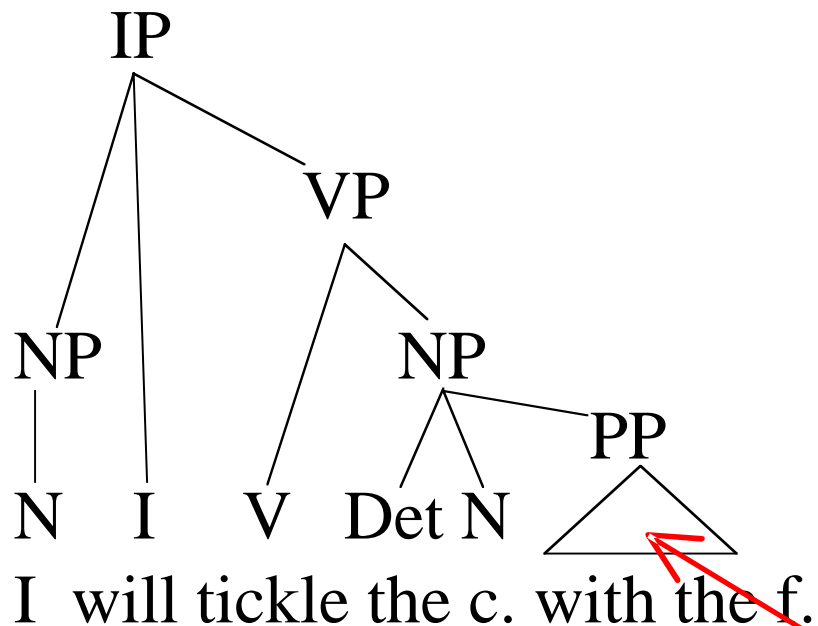- IP **immediately dominates** NP, I, and VP
- IP **dominates** NP, I, VP, NP, Det, N.....

```
              IP
           /      \
          /        VP
         /        /   \
       NP        /     NP
        |       /     /   \
        |      /     /     PP
        N   I  V   Det  N   /\
        I  will tickle the c. with the f.
```

terminology break:

IP
VP
NP   NP
PP
N   I   V   Det N
I will tickle the c. with the f.

- Det, N, and PP are **sisters**
- NP is the **mother** of Det, N, and PP
- IP **immediately dominates** NP, I, and VP
- IP **dominates** NP, I, VP, NP, Det, N.....
- α is a **constituent** if all and only the words in α are dominated by some node.

terminology break:

IP

VP

NP   NP

                      PP

N   I   V   Det N   △

I will tickle the c. with the f.

- Det, N, and PP are **sisters**
- NP is the **mother** of Det,N, and PP
- IP **immediately dominates** NP, I, and VP
- IP **dominates** NP, I, VP, NP, Det, N.....
- α is a **constituent** if all and only the words in α are dominated by some node.
- **triangle**

splitting the atom further...X' levels
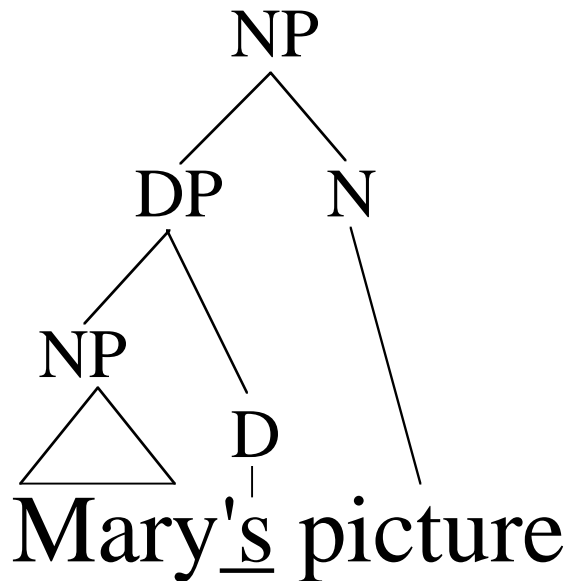
Mary's picture

X' levels

Mary's picture   *the Mary's picture

the   picture   *Mary's the picture
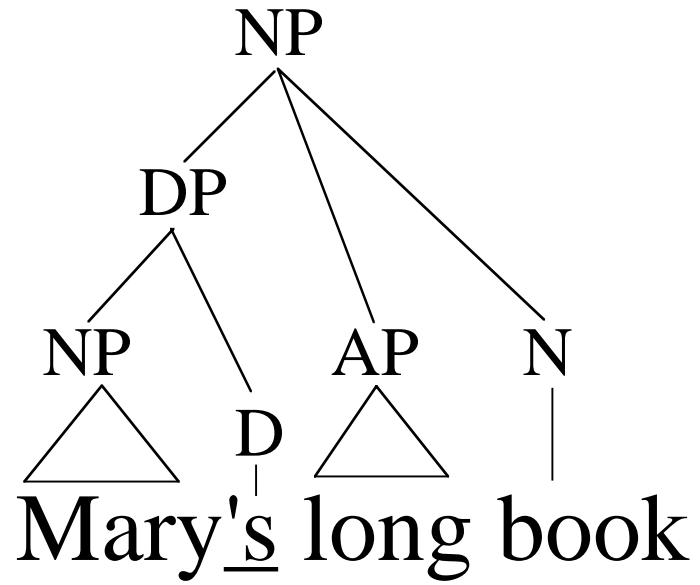
a   picture   *a Mary's picture...

X' levels

Mary's picture   *the Mary's picture
the   picture   *Mary's the picture
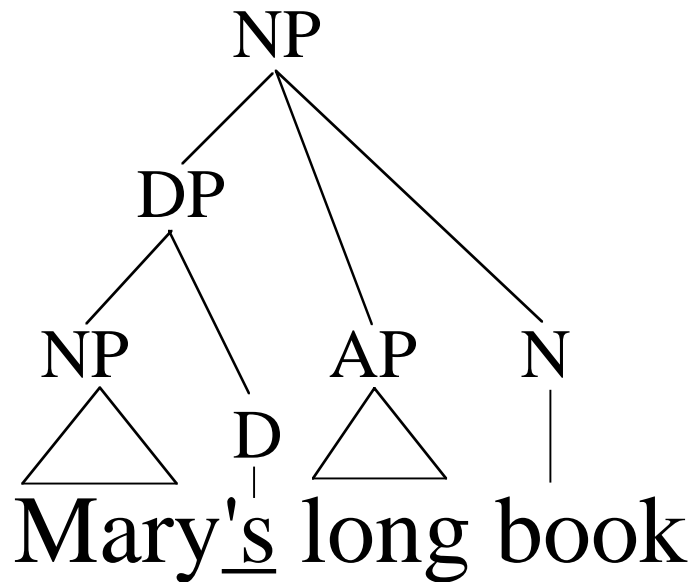a   picture   *a Mary's picture...

```
              NP
             /  \
          DP      N
         /  \      \
       NP    \      \
      /  \    D      \
   Mary's picture
```

Mary's picture   (why does *'s* require an NP?)

X' levels

NP
- DP
  - NP
    - △ Mary's
  - D
    - 's
- AP
  - △ long
- N
  - book

X' levels

```
              NP
             /  \
           DP    \
          /  \    \
        NP    \   AP    N
       / \    D  / \    |
      /___\   | /___\   |
     Mary's long    book
```
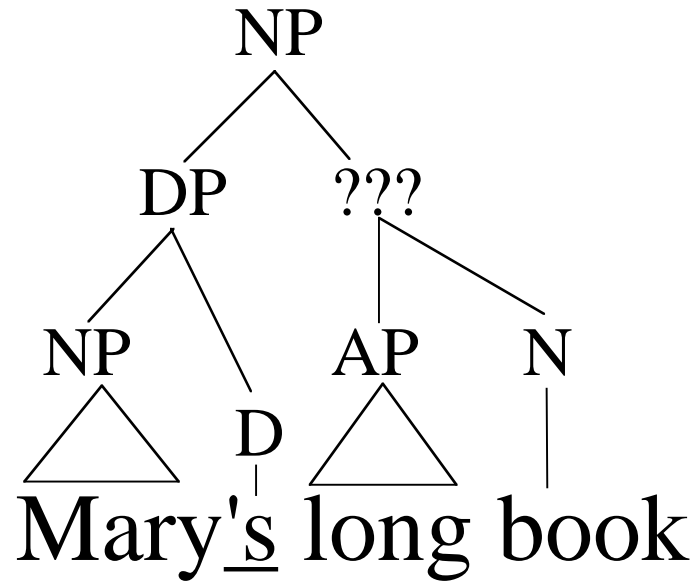
Mary's long book

coordination

I liked Mary's [long book] and [short essays]

ellipsis
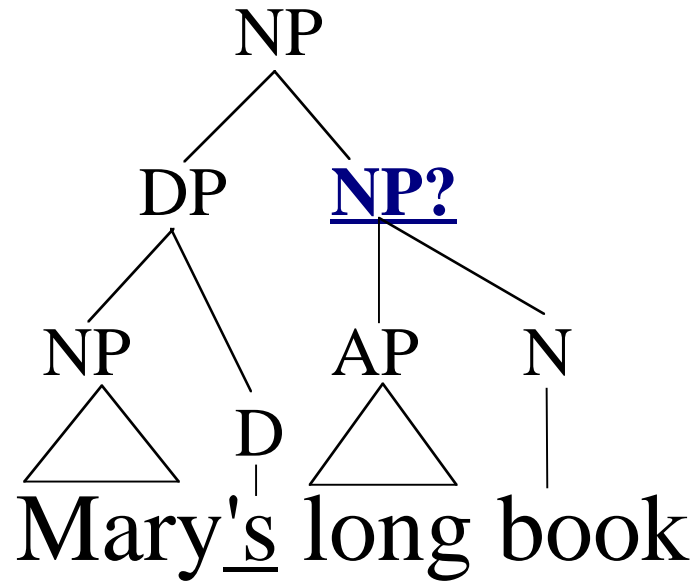
I liked Mary's [long book] but hated John's [].
*I liked Mary's long book but hated [] sonata.

X' levels

```
                NP
              /    \
           DP       ???
          /  \      /  \
        NP    D   AP    N
        /\    |   /\     |
     Mary's  long  book
```

Mary'<u>s</u> long book

X' levels

NP
- DP
  - NP (△ Mary)
  - D ('s)
- **NP?**
  - AP (△ long)
  - N (book)

Mary's long book

X' levels

```
                NP
              /    \
           DP      NP?
          /  \    /   \
        NP    \  AP    N
       /__\    D /__\   |
      Mary's long book
```
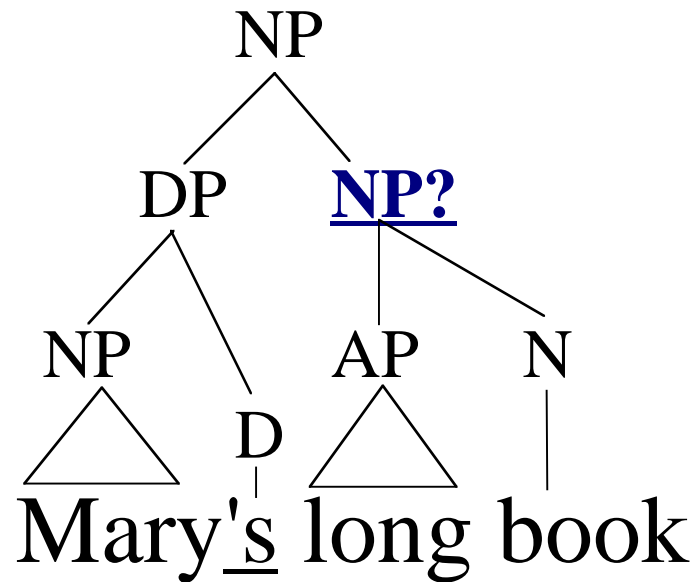
No: if NP-->DP NP, then:

   *Mary's Bob's (....) picture

X' levels

NP
  DP   N'
  NP   D   AP   N
Mary's long book
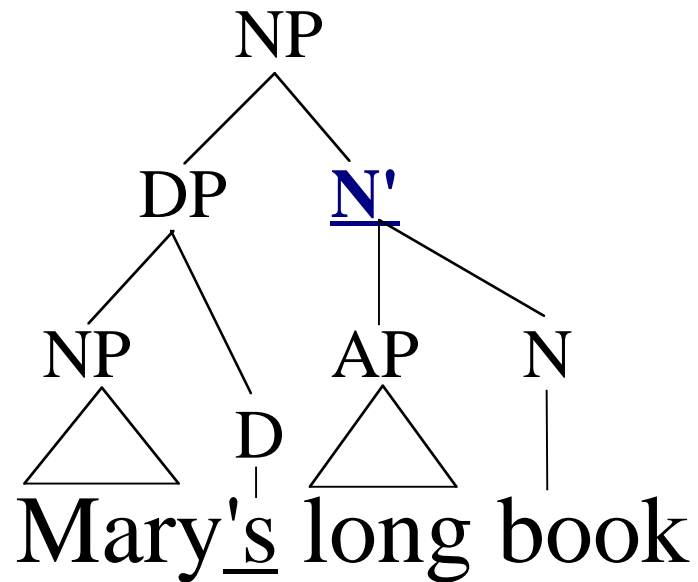
NP-->(DP) N'
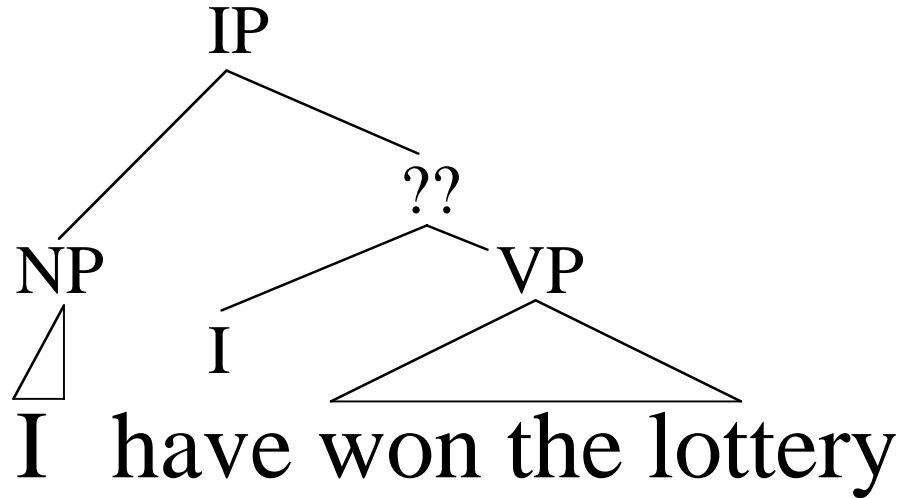N'--> (AP) N (PP)

X' levels: not just for NP

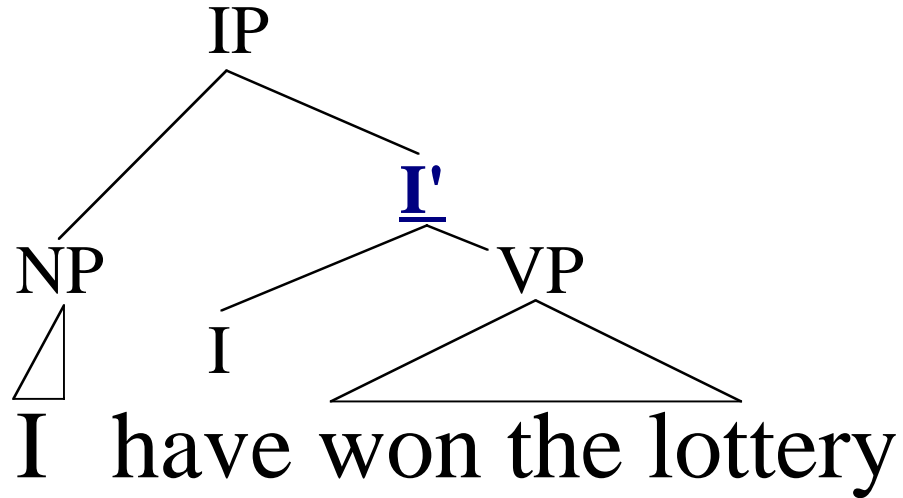I [have won the lottery]
I [will never work again]

-->I [have won the lottery] and
   [will never work again]

X' levels

-->I [have won the lottery] and
 [will never work again]

```
               IP
             /    \
            /      \
           /     ?? \
          /        / \
        NP        /   VP
        /\       I   /  \
       /  \         /    \
      I    have won the lottery
```

X' levels

-->I [have won the lottery] and
    [will never work again]

```
            IP
           /  \
          /    \
         /      I'
        /      / \
       NP     /   VP
      /|     /    / \
     / |    I    /   \
    /  |        /     \
   I  have  won the lottery
```

X' levels
NP-->(DP) N'
N'--> (AP) N (PP)

IP--> NP I'
I'--> I VP

X' levels

NP-->(DP) N'

N'--> (AP) N (PP)

IP--> NP I'

I'--> I VP

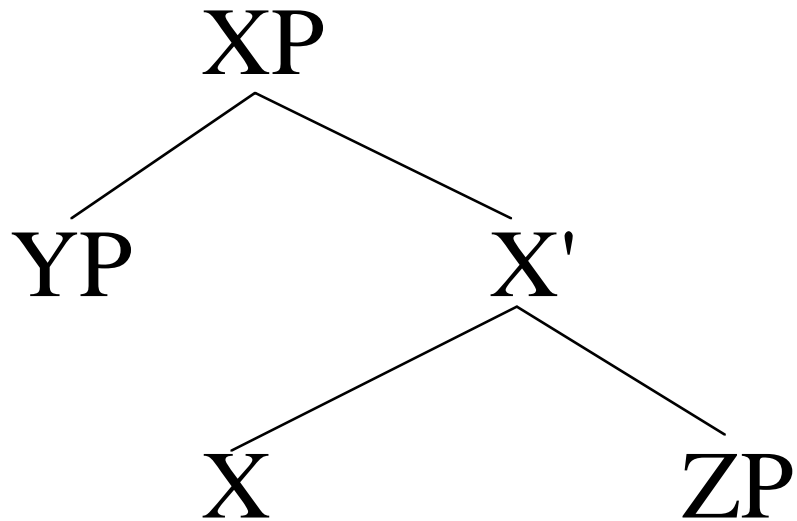**XP--> (YP) X'**

X'--> (WP) X (ZP)

X-bar schema
XP--> (YP) X'
X'--> (WP) X (ZP)
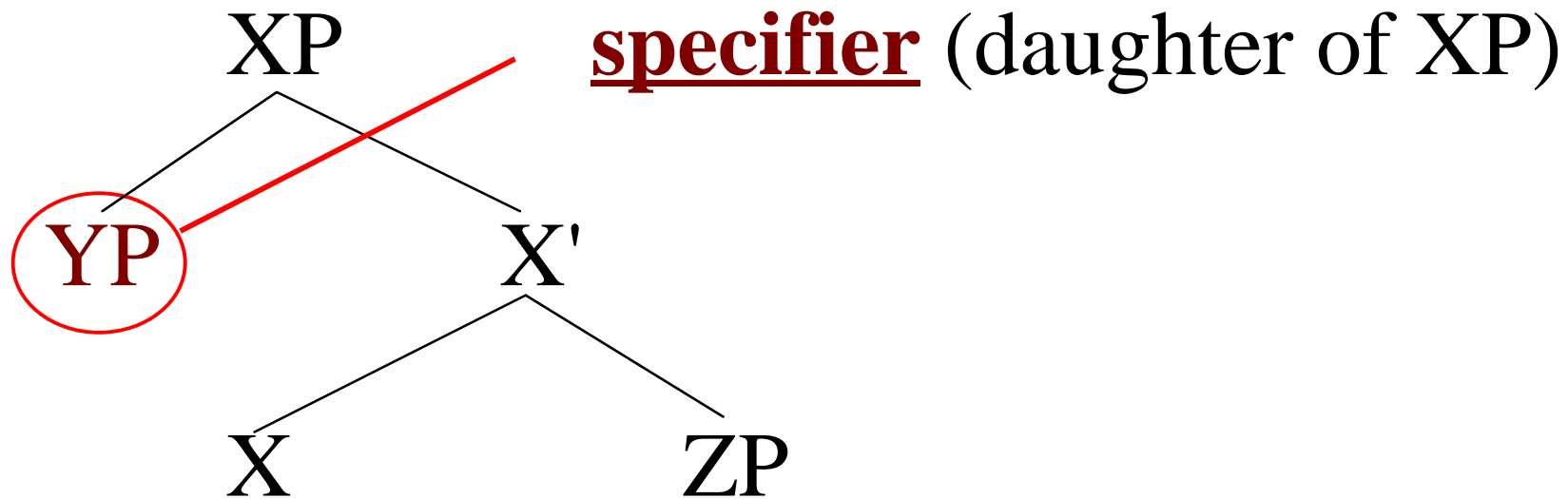
```
          XP
         /  \
        /    \
      YP      X'
             /  \
            /    \
           X      ZP
```

X-bar schema
XP--> (YP) X'
X'--> (WP) X (ZP)

XP   **specifier** (daughter of XP)

YP

X'

X   ZP

X-bar schema

XP--> (YP) X'

X'--> (WP) X (ZP)

```
              XP
             /  \
            /    \
          YP      X'
                 /  \
                /    \
               X      ZP  ───  complement
```
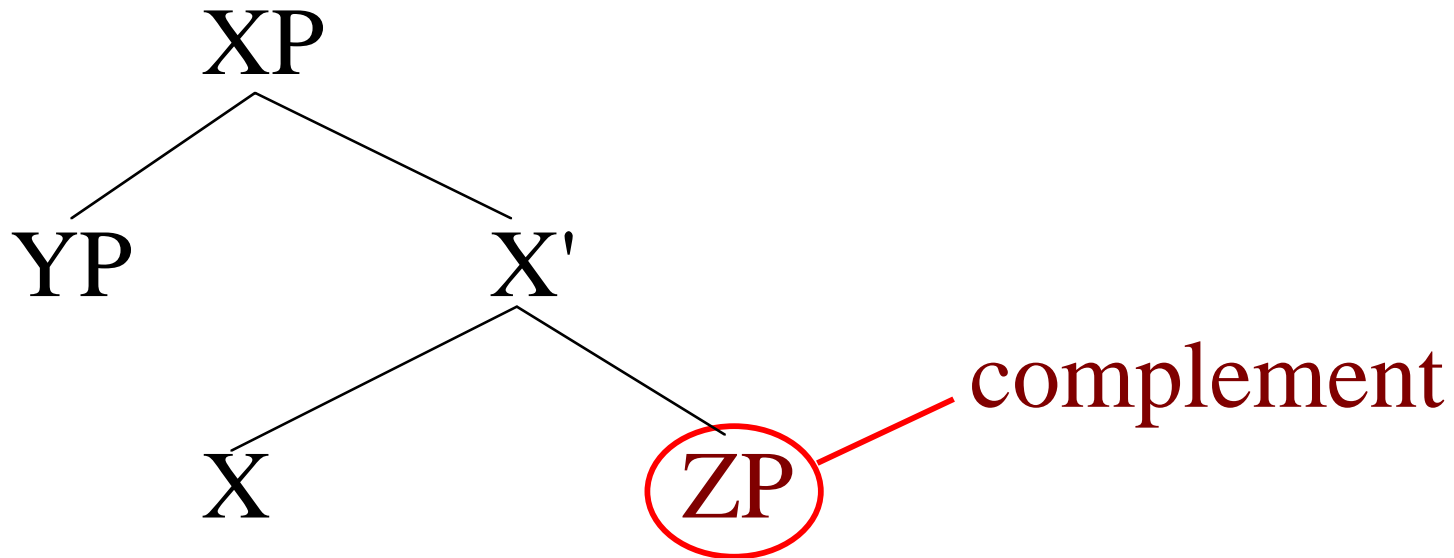
X-bar schema

XP--> (YP) X'

X'--> (WP) X (ZP)

VP--> V (NP) (PP)

X-bar schema

XP--> (YP) X'

X'--> (WP) X (ZP)

VP--> V (NP) (PP)

    The ants **thrived**.
    The anteater **arrived**.
    The anteater **devoured** the ants.
    Mary **slapped** the anteater.

<u>X-bar schema</u>

XP--> (YP) X'

X'--> (WP) X (ZP)

VP--> V (NP) (PP)

* The ants **<u>thrived</u>** the ant-farm.
* The anteater **<u>arrived</u>** the house.
* The anteater **<u>devoured</u>**.
* Mary **<u>slapped</u>**.

arrive /ərajv/

"get to a place"

V

intransitive (must not have an NP sister)

slap /slæp/

"strike with the flat of the hand"

V

transitive (must have an NP sister)

selection/subcategorization:
heads get to say what their complements
    should be.

not just NP....

    The anteater put the ants on the plate.
*   The anteater put on the plate.
*   The anteater put the ants.
*   The anteater put.

-->***put*** selects for an NP and a PP.

X-bar schema

XP--> (YP) X'

X'--> (WP) X (ZP)

...with selection filling in some of the gaps.

...but not everything is selected:

the bug
the big bug
the big black bug
the big black flying bug

...but not everything is selected:

the bug   (orange, anteater...)
the big bug
the big black bug
the big black flying bug

...not everything is selected:

the student
the student with blue hair
the student with blue hair in the front row

...not everything is selected:

the student   (orange, anteater...)
the student with blue hair
the student with blue hair in the front row

...but some things are selected:

the student of physics
*the orange of physics
*the anteater of physics

the student with blue hair
the orange with blue hair
the anteater with blue hair

X-bar schema

XP--> (YP) X'

X'--> (TP) X' (UP)

X'--> (WP) X (ZP)
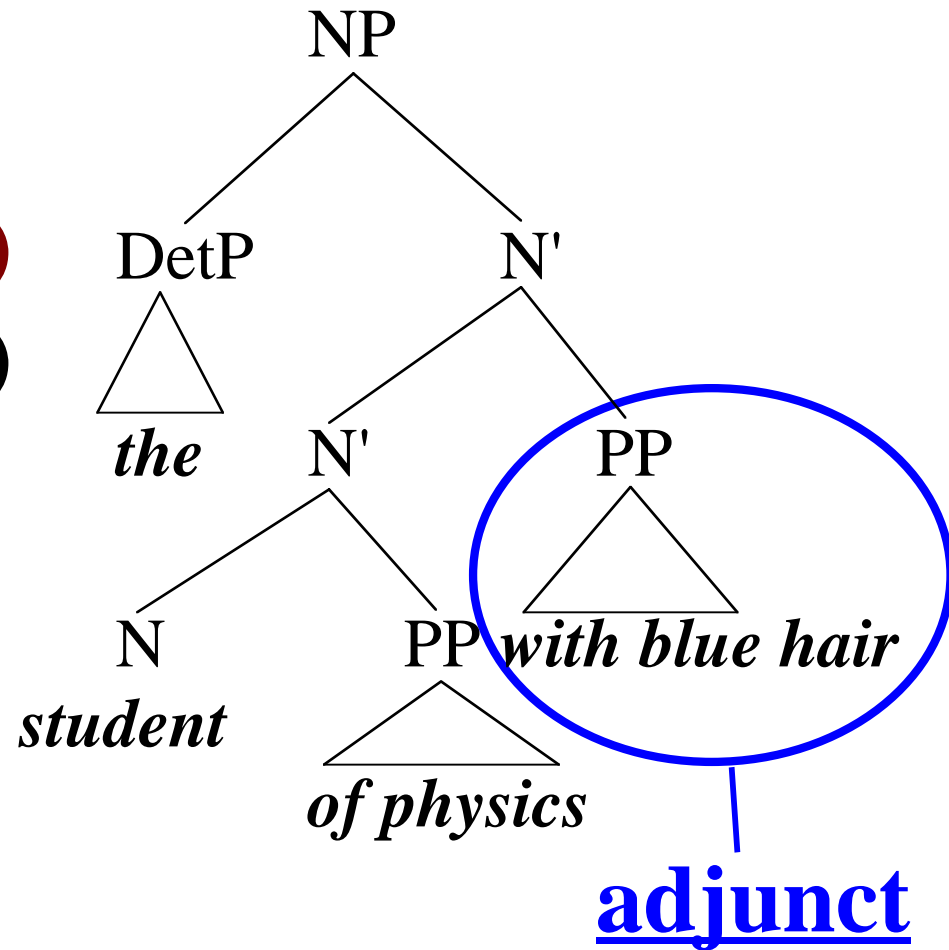
X-bar schema
XP--> (YP) X'
X'--> (TP) X' (UP)
X'--> (WP) X (ZP)

NP
- DetP
  - *the*
- N'
  - N'
    - N
      - *student*
    - PP
      - *of physics*
  - PP
    - *with blue hair*

adjunct

X-bar schema
XP--> (YP) X'
X'--> (TP) X' (UP)
X'--> (WP) X (ZP)

```
                         NP
                        /  \
                       /    \
                    DetP      N'
                     /\      /  \
                    /  \    /    \
                   the  N'       PP
                       /  \      /\
                      /    \    /  \
                     N      PP with blue hair
                  student   /\
                           /  \
                        of physics
```
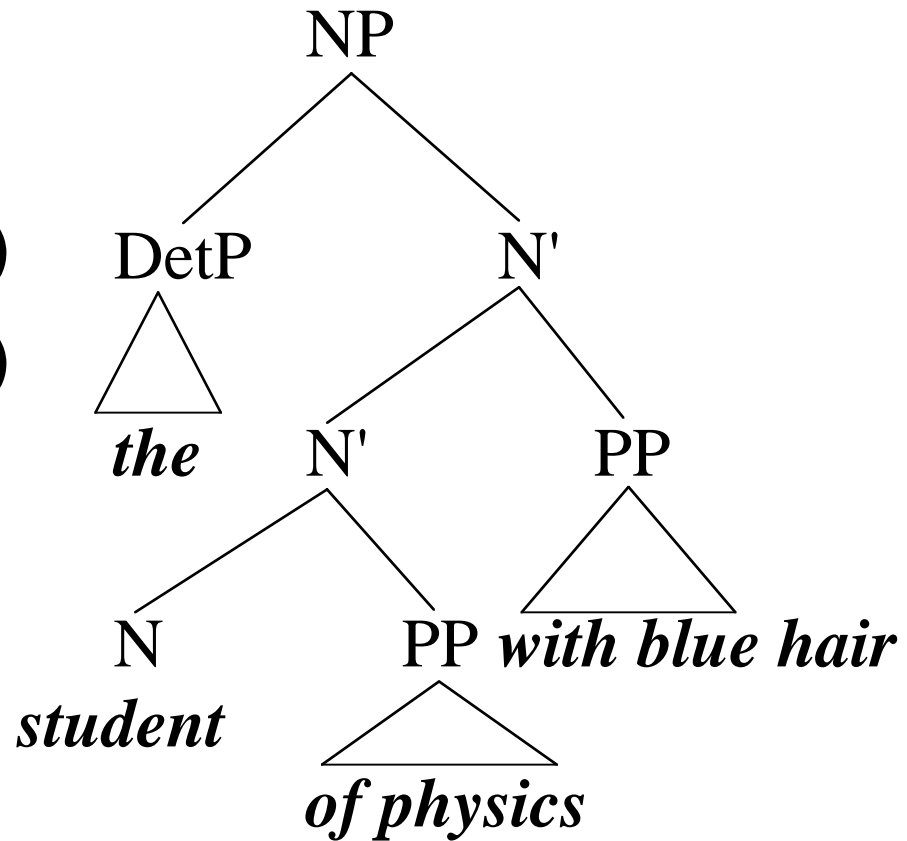
Projection Principle
All and only **complements** are selected by the head.

X-bar schema
XP--> (YP) X'
X'--> (TP) X' (UP)
X'--> (WP) X (ZP)

NP

DetP   N'

the   N'   PP

N   PP   *with blue hair*
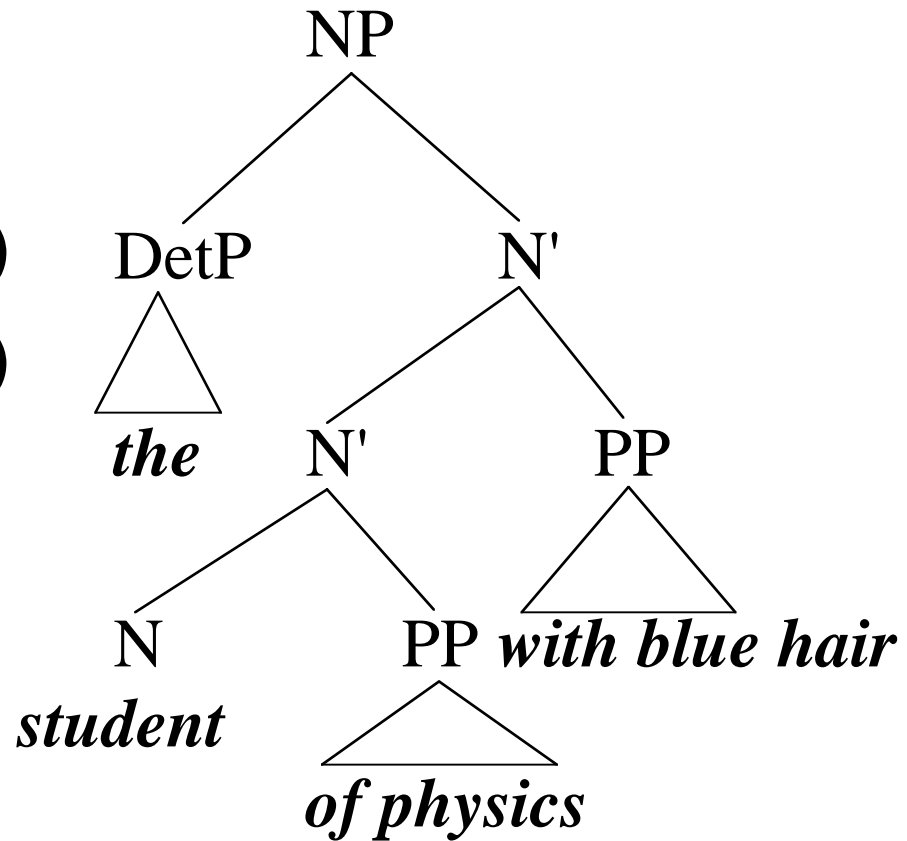
student   *of physics*

the student [with blue hair] [in the front row]
*the student [of physics] [of chemistry]

X-bar schema

XP--> (YP) X'
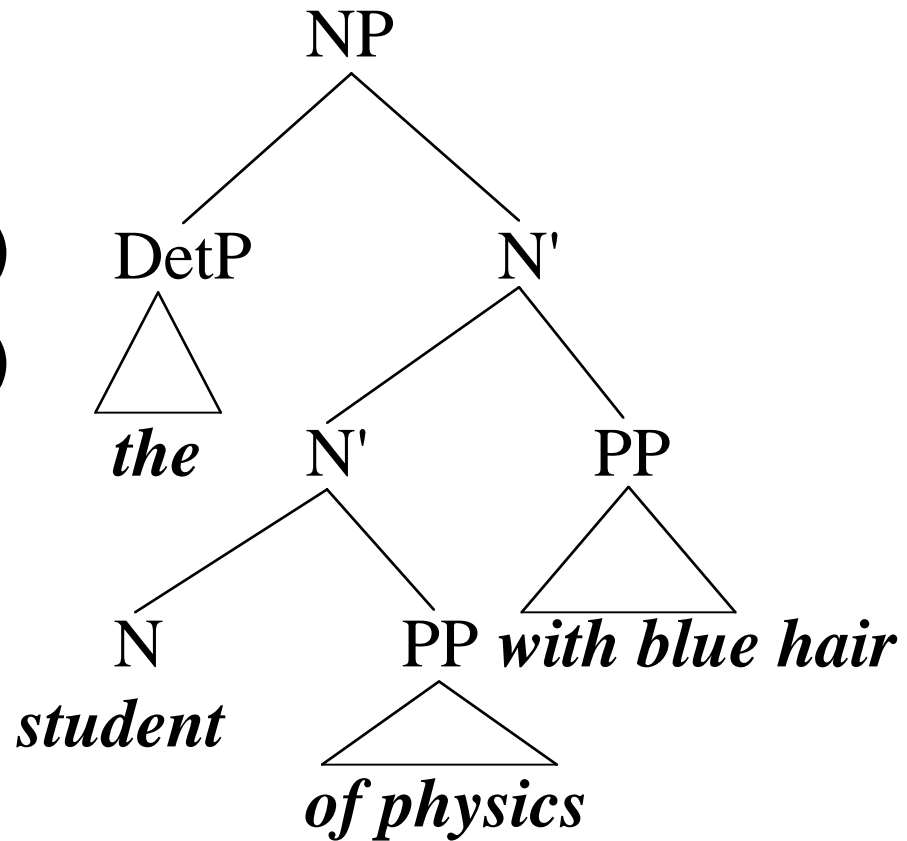
X'--> (TP) X' (UP)

X'--> (WP) X (ZP)

student [of physics] [with blue hair]
*student [with blue hair] [of physics]

X-bar schema

XP--> (YP) X'

X'--> (TP) X' (UP)

X'--> (WP) X (ZP)

NP

DetP

the

N'

N'

N

student

PP

of physics

PP
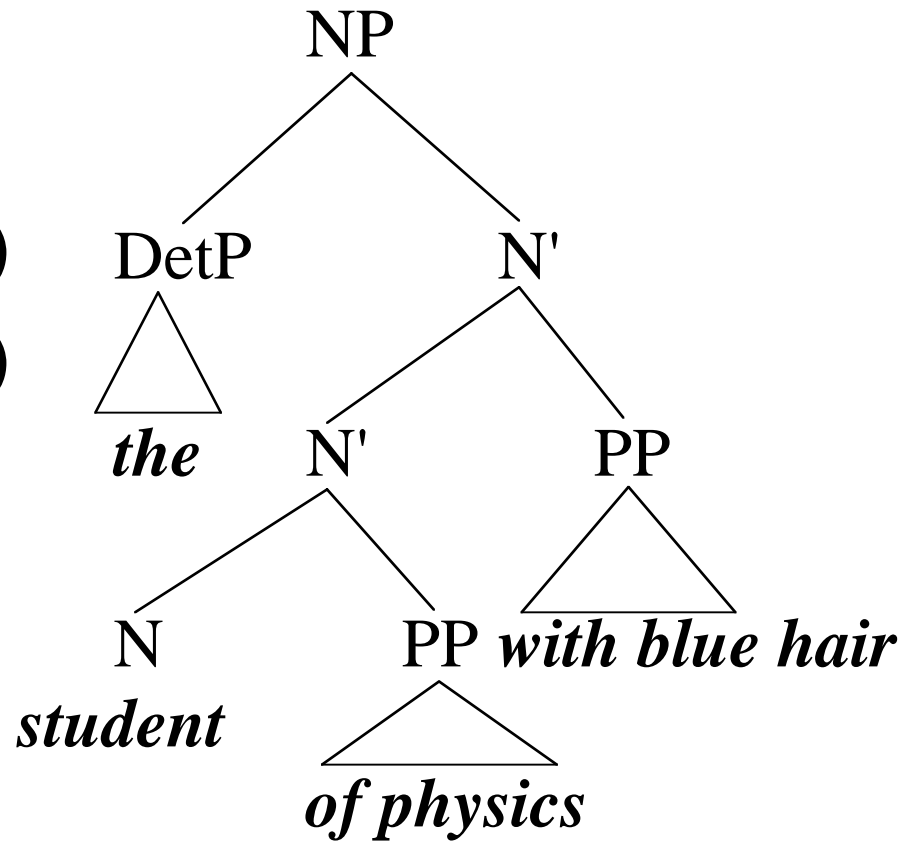
with blue hair

the [[**student of physics**]
and [**purveyor of fine chocolates**]]
[with blue hair]

The anteater will put **the ants** **into the bowl**
*The anteater will put **into the bowl**
*The anteater will put **the ants**

-->*put* selects for an NP and a PP
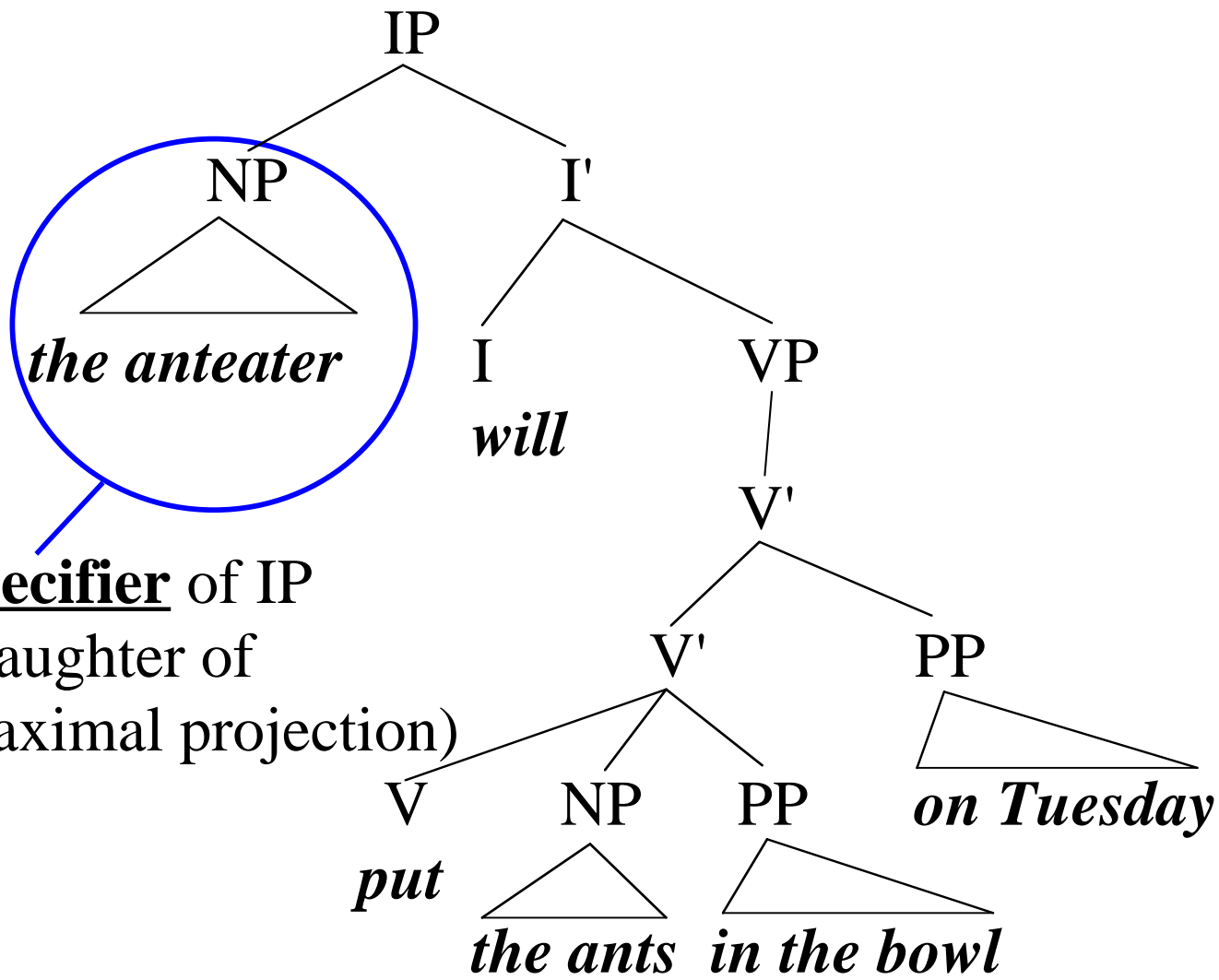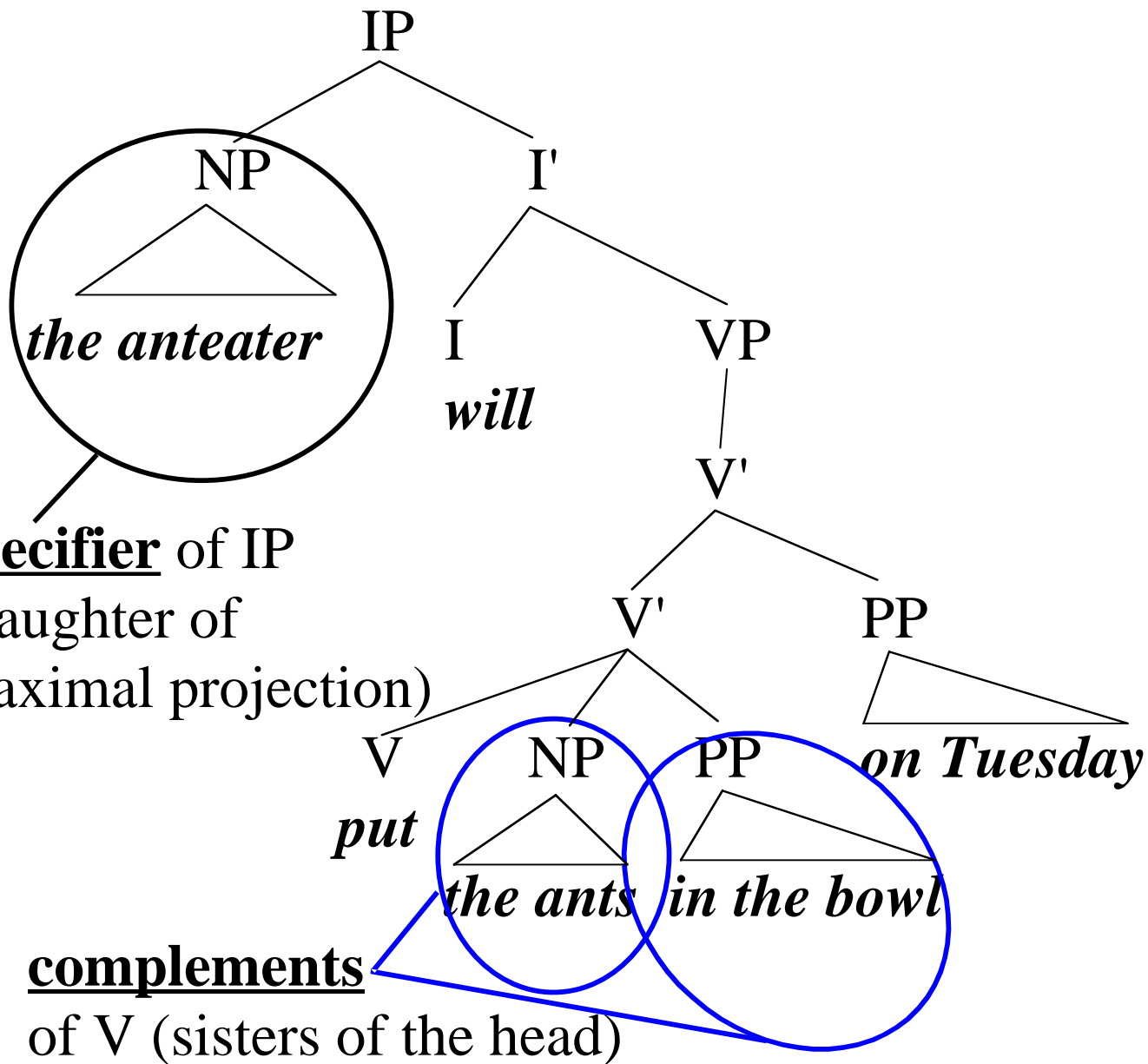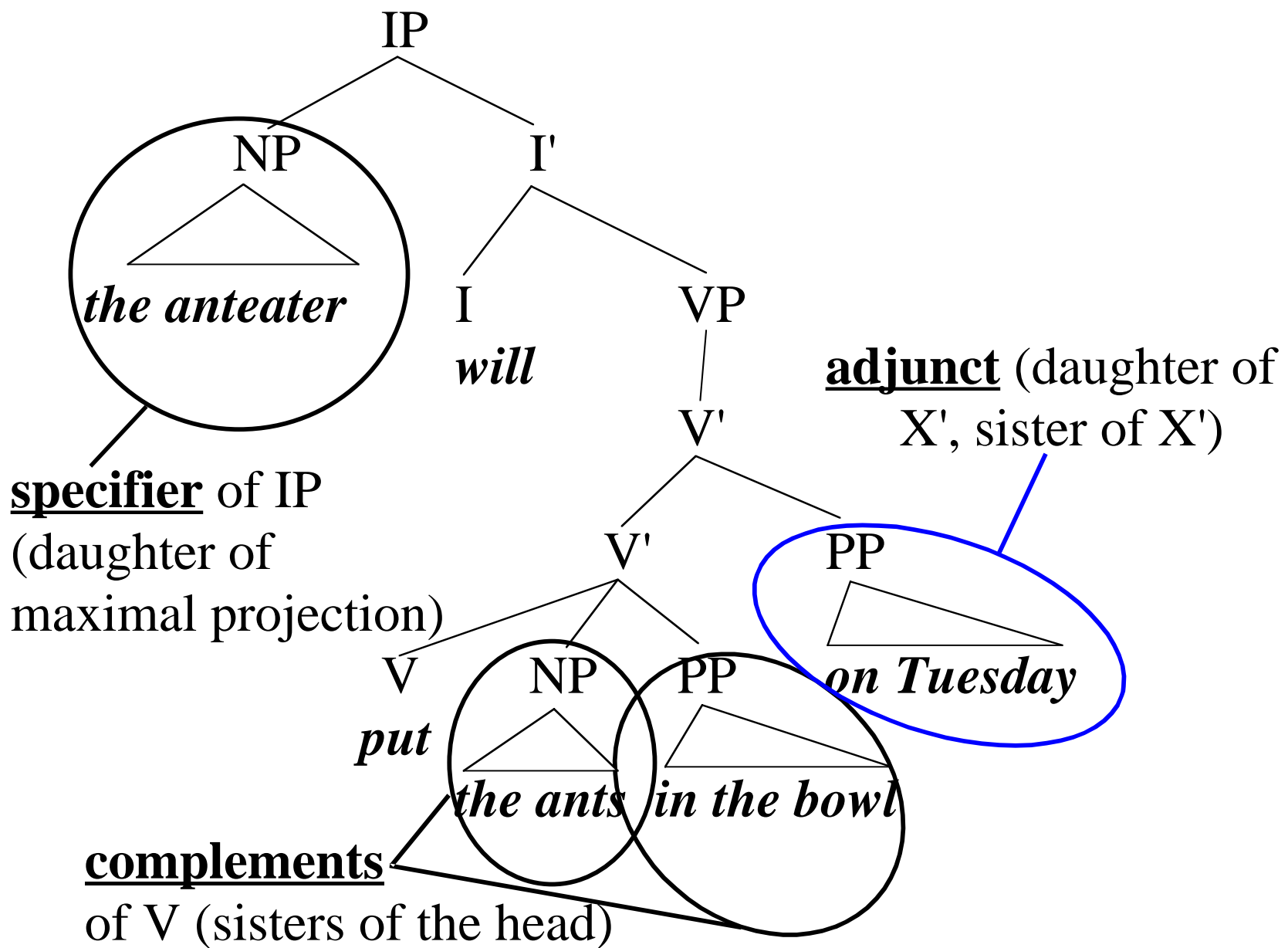
```
                        IP
                   /          \
                 NP            I'
                /  \          /    \
          △              I        VP
      the anteater      will        |
                                    V'
                                  /     \
                               V'         PP
                             /  |  \      △
                            V   NP   PP   on Tuesday
                            |   △    △
                           put the ants in the bowl
```
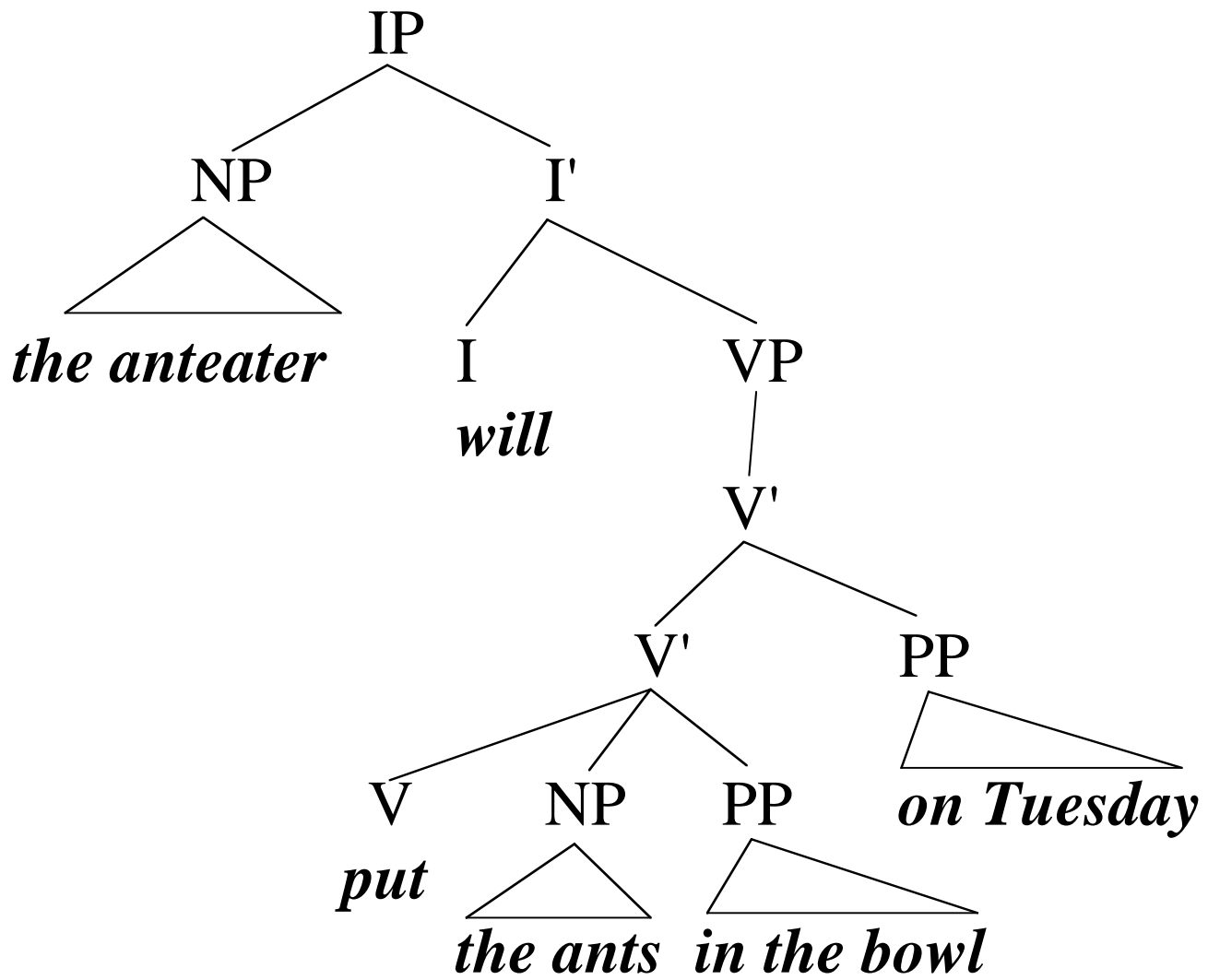
IP

NP

the anteater

I'

I

will

VP

V'

V'

PP

V

put

NP

the ants

PP

in the bowl

on Tuesday

specifier of IP
(daughter of
maximal projection)

IP

NP

the anteater

specifier of IP
(daughter of
maximal projection)

I'

I
will

VP

V'

V'

PP

V
put

NP

PP

on Tuesday

the ants

in the bowl

complements
of V (sisters of the head)

IP

NP

the anteater

specifier of IP
(daughter of
maximal projection)

I'

I
will

VP

V'

adjunct (daughter of
X', sister of X')

V'

PP

on Tuesday

V
put

NP

PP

the ants *in the bowl*

complements
of V (sisters of the head)

The anteater will put **the ants** **into the bowl**
*The anteater will put **into the bowl**
*The anteater will put **the ants**

What will the anteater put **into the bowl**?

-->failure of subcategorization?

The anteater will put **the ants** **on the plate**
*The anteater will put **on the plate**
*The anteater will put **the ants**

the anteater will put **what** **on the plate**?

The anteater will put **the ants on the plate**
*The anteater will put **on the plate**
*The anteater will put **the ants**

What will the anteater put __ **on the plate**?
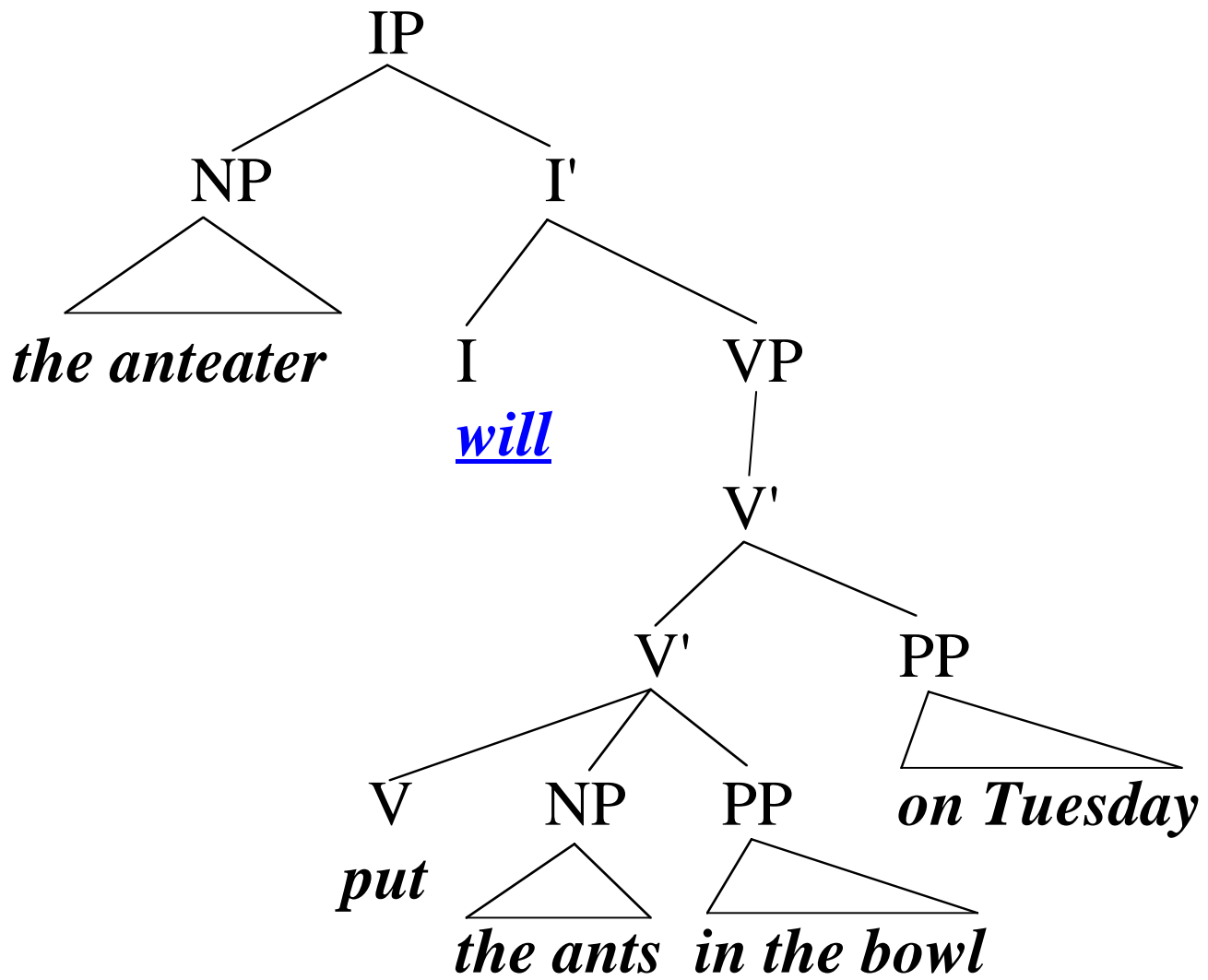
actually, two things are moving...
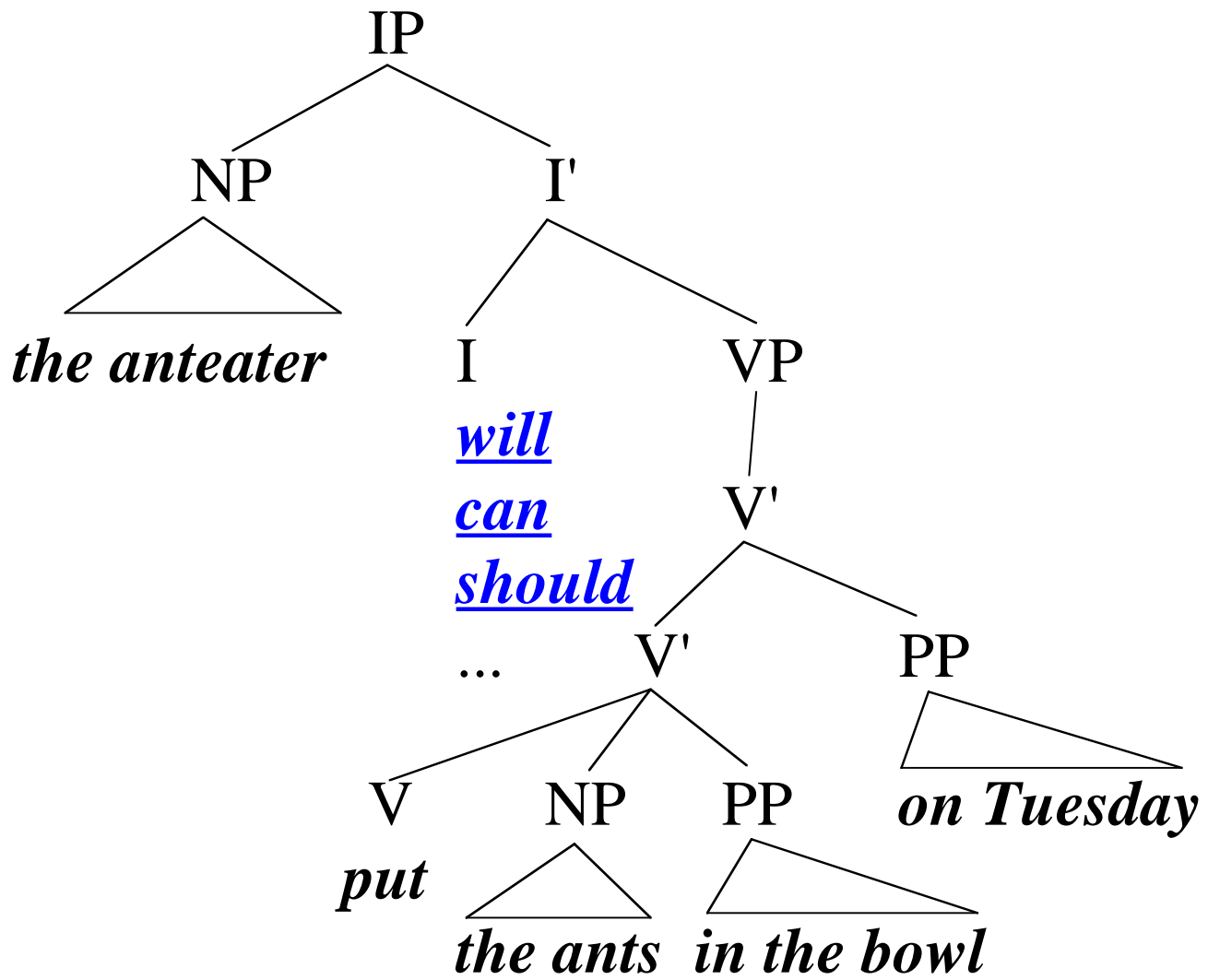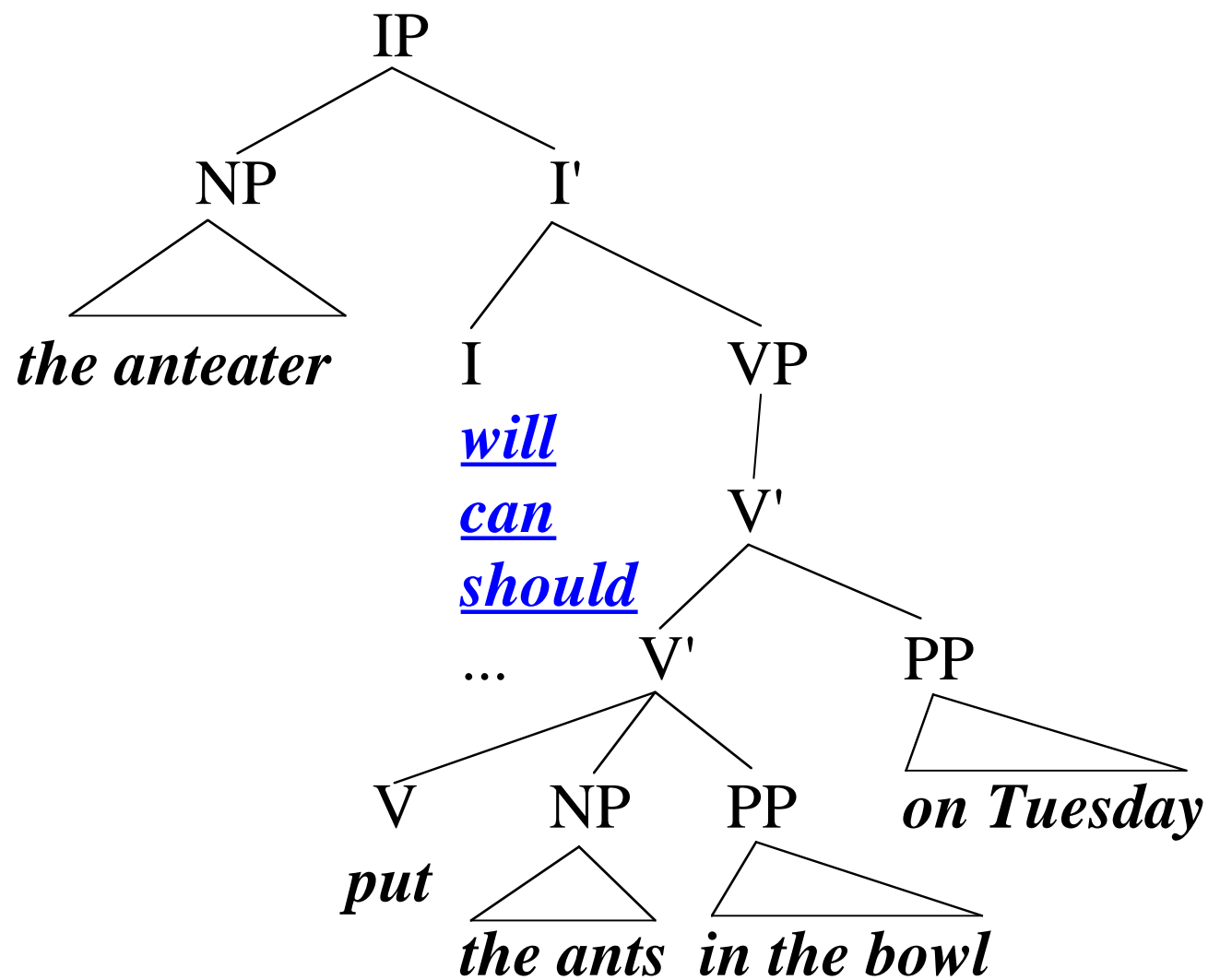
What will the anteater __ put __ on the p.?

...and since **will** is **bright blue**, let's concentrate on it first.

IP

- NP
  - *the anteater*
- I'
  - I
    - *will*
    - *can*
    - *should*
    - ...
  - VP
    - V'
      - V'
        - V
          - *put*
        - NP
          - *the ants*
        - PP
          - *in the bowl*
      - PP
        - *on Tuesday*

```
                              IP
                          /        \
                        NP          I'
                       /  \        /    \
               the anteater       I        VP
                                 will        |
                                 can         V'
                                 should    /    \
                                 ...     V'       PP
                                        / | \      /    \
                                       V  NP  PP  on Tuesday
                                      put  / \   /   \
                                    the ants  in the bowl
```

*The anteater **will** **can** put the ants...
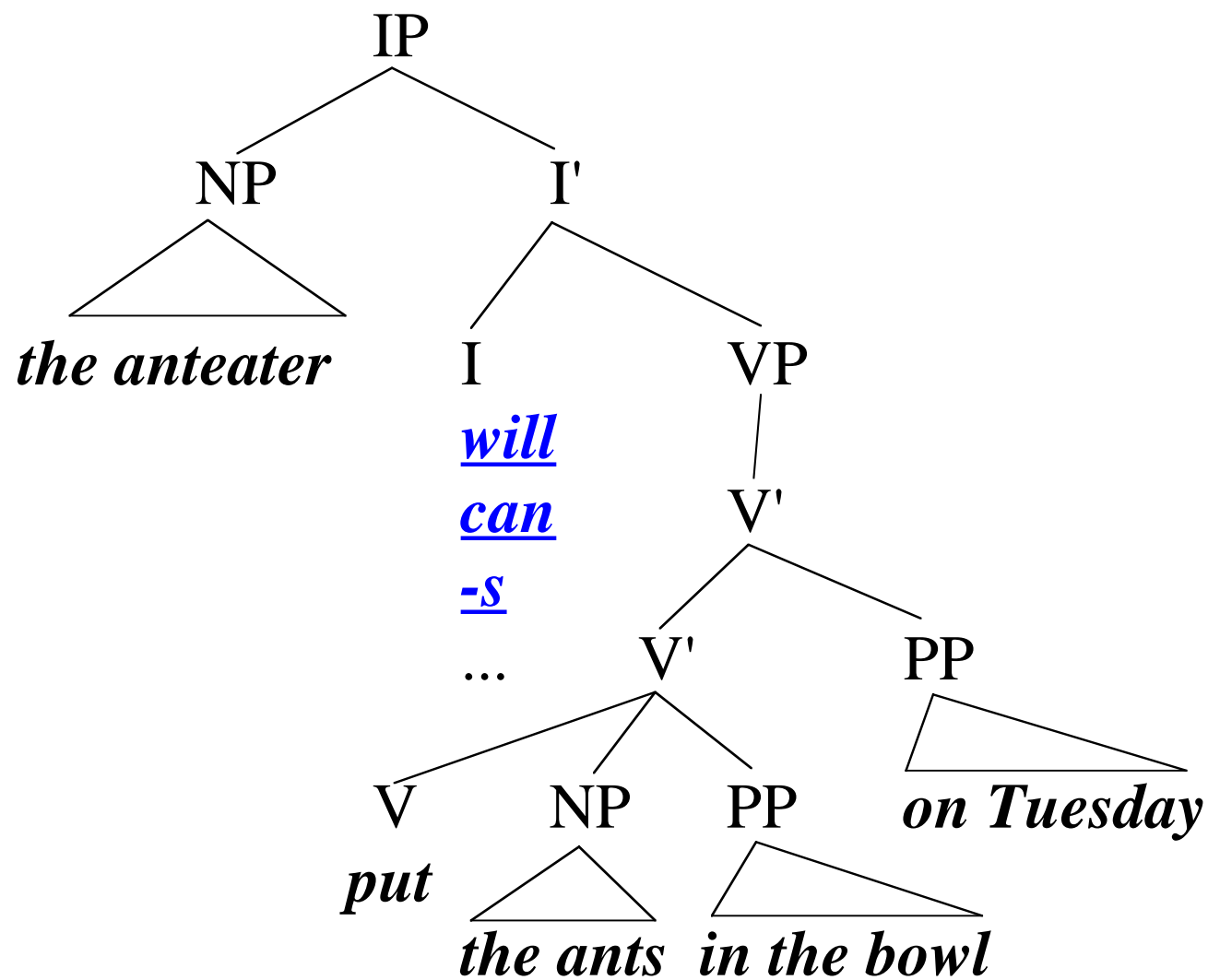
The anteater put**s** the ants...

*The anteater **will** put**s** the ants...

IP

NP

the anteater

I'

I

will
-s
-d
-Ø

VP

V'

V'

PP

V

NP

PP

on Tuesday

put

the ants *in the bowl*
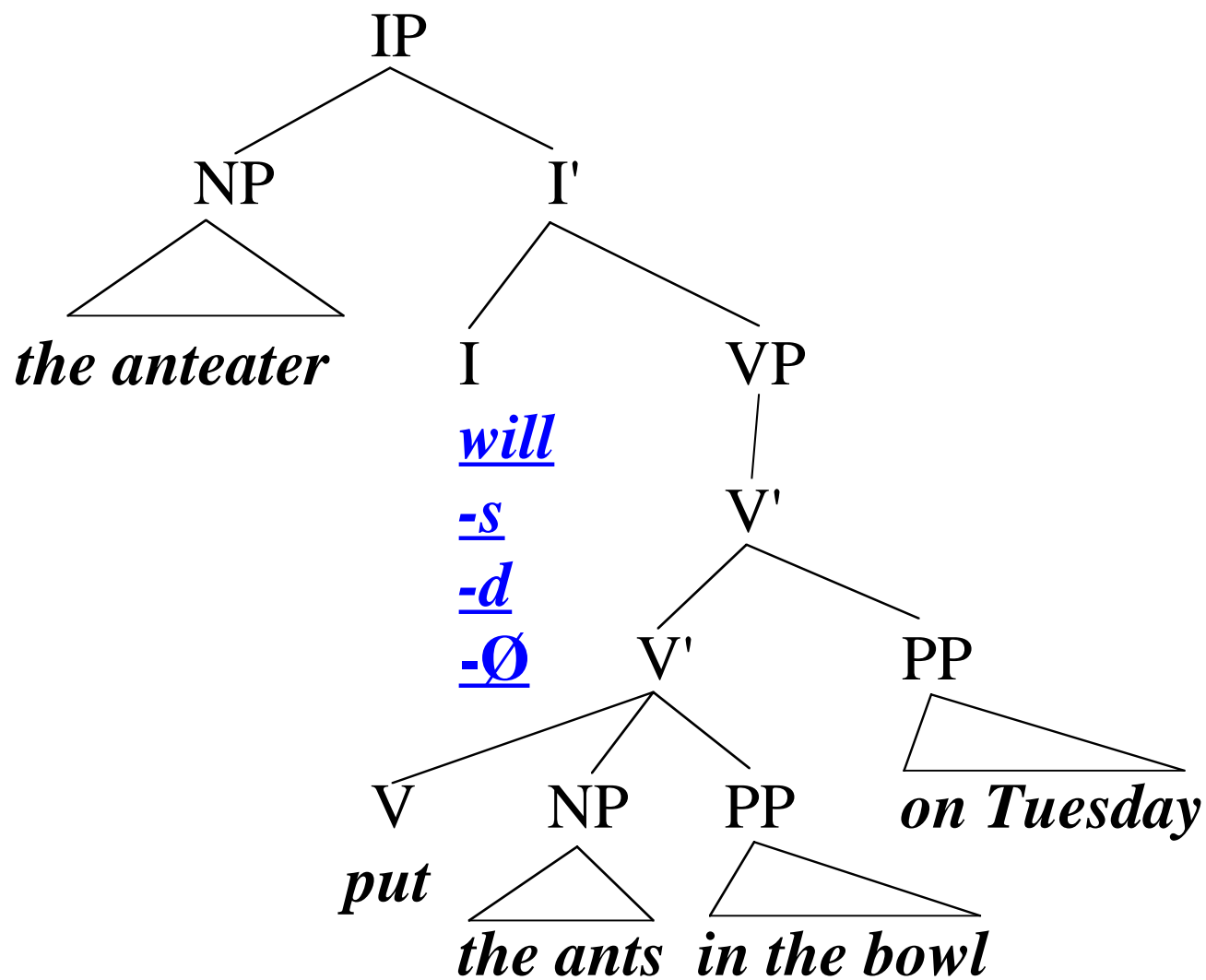
The anteater **put-Ø** the ants...
The anteater **place-d** the ants...

I next to V somehow gets onto V

a new XP: CP

The anteater will eat ants.

a new XP: CP

The anteater will eat ants.

I wonder [**whether** the anteater will eat ants]

I believe [**that** the anteater will eat ants]

a new XP: CP

The anteater will eat ants.

I wonder [**whether** the anteater will eat ants]

I believe [**that** the anteater will eat ants]

[**that** the anteater will eat ants], I believe.

I believe [**that** the anteater will eat ants]
and [**that** the earth is flat]
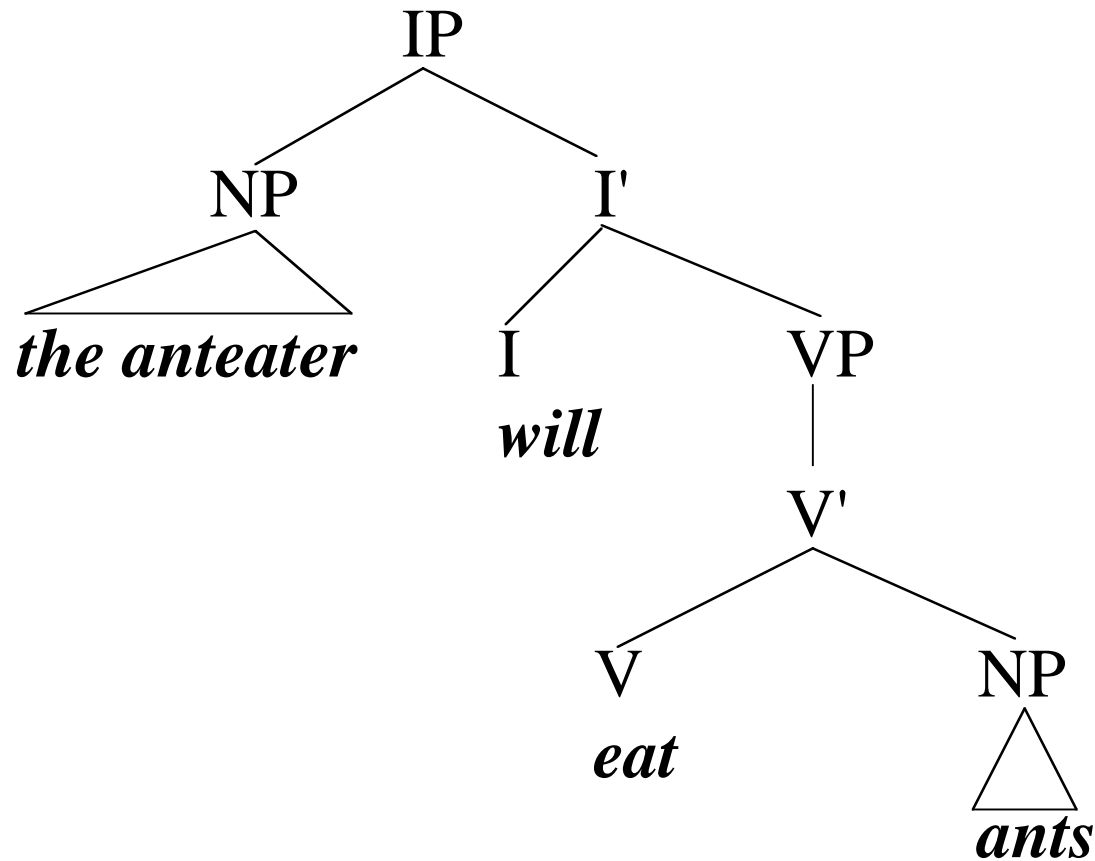
a new XP: CP

The anteater will eat ants.

I wonder [**whether** the anteater will eat ants]
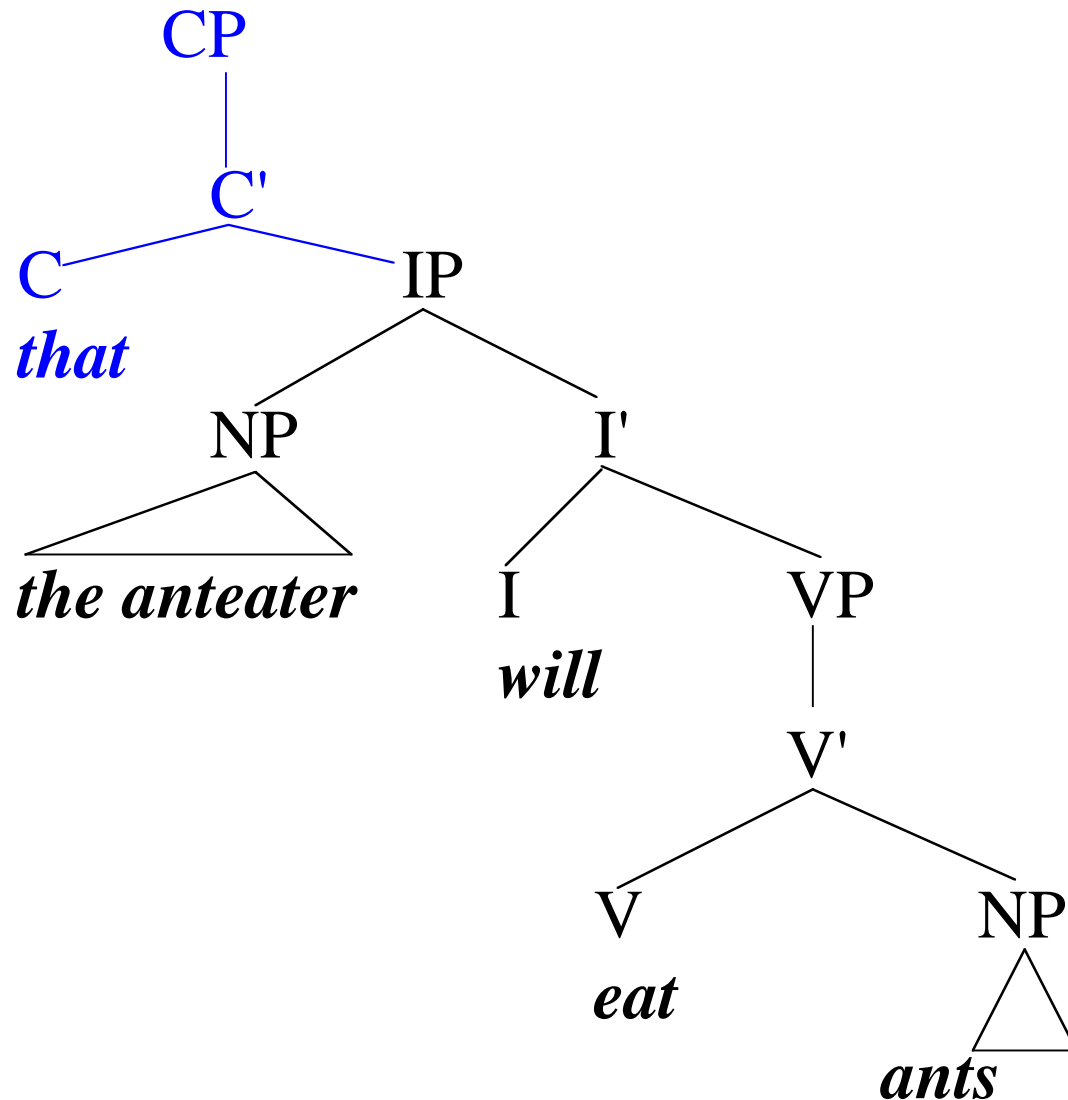
I believe [**that** the anteater will eat ants]

*I wonder [**that** the anteater will eat ants]

*I believe [**whether** the anteater will eat ants]

I believe [**that** the anteater will eat ants]

```
                    IP
                  /    \
                NP      I'
               /  \    /  \
          (the anteater) I   VP
                        will   |
                              V'
                             /  \
                            V    NP
                          eat    /\
                               ants
```

I believe [**that** the anteater will eat ants]

CP
  C'
C   IP
that
    NP   I'
  the anteater   I   VP
                  will   V'
                         V   NP
                        eat
                              ants

I believe [**that** the anteater will eat ants]

```
                    IP
                   /  \
                 NP    I'
                 /\   /  \
                /  \ I    VP
               I    Ø      |
                          V'
                         /  \
                        V    CP
                     believe  /\
                             /  \
                            /    \
              that the anteater will eat ants
```
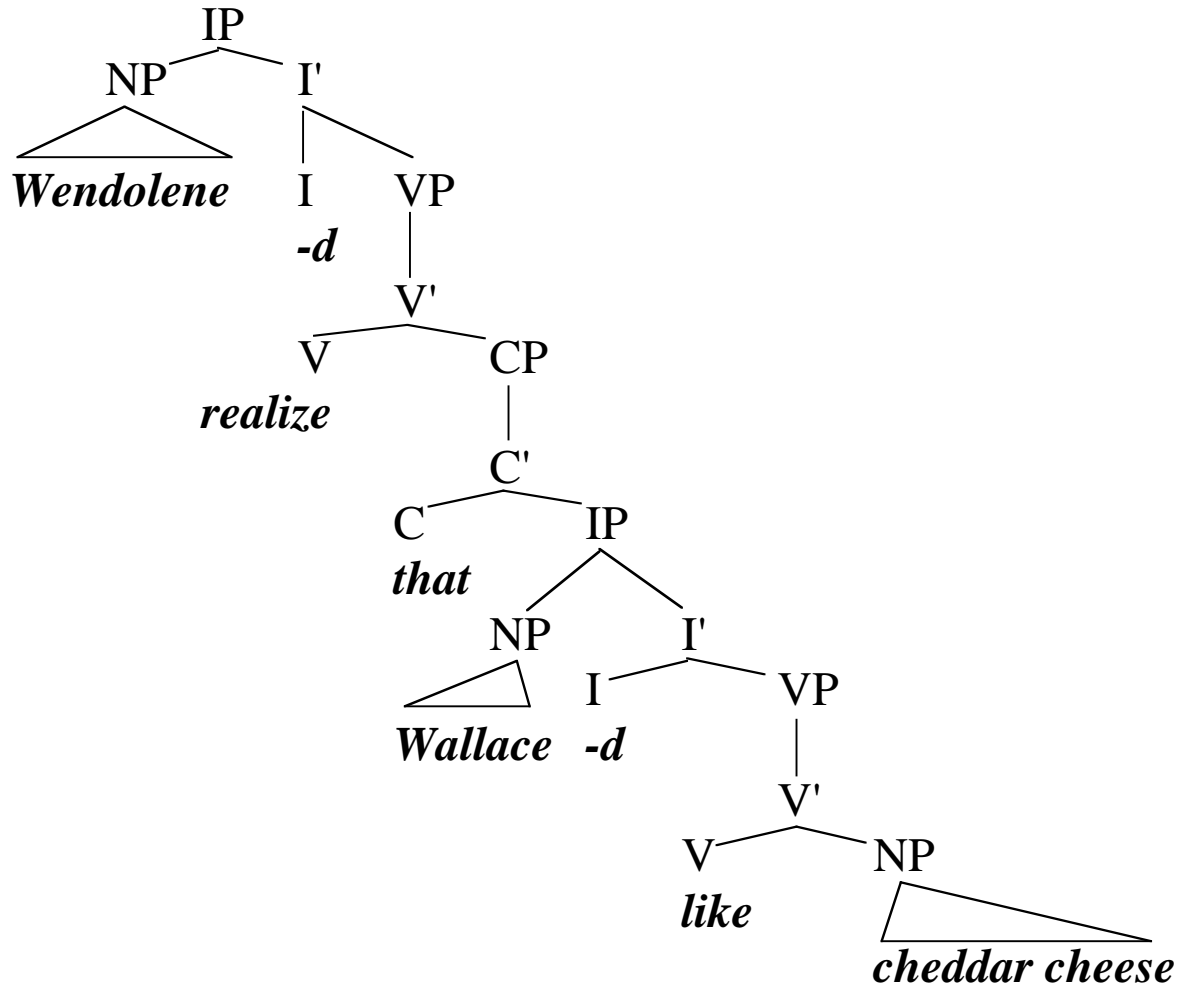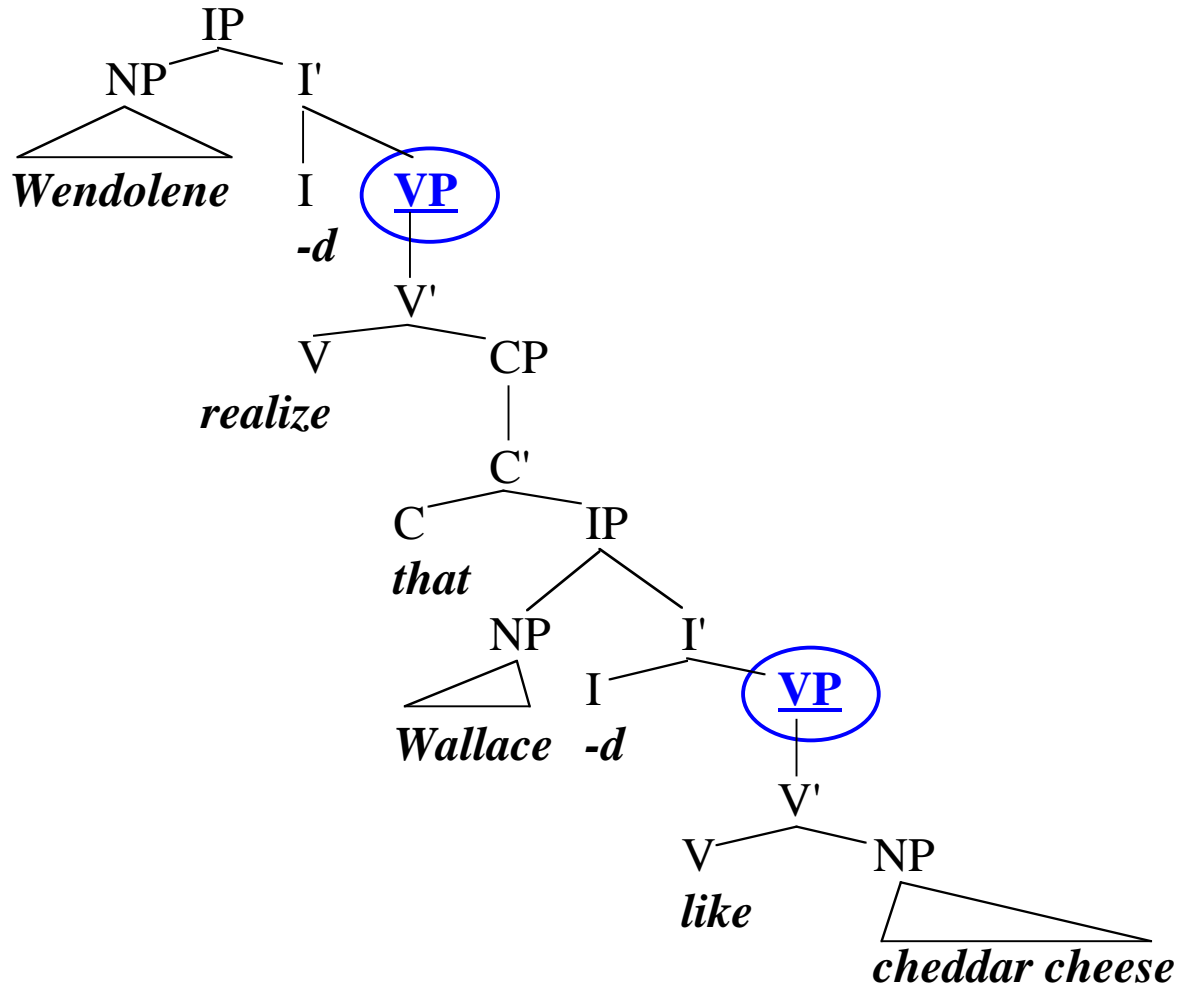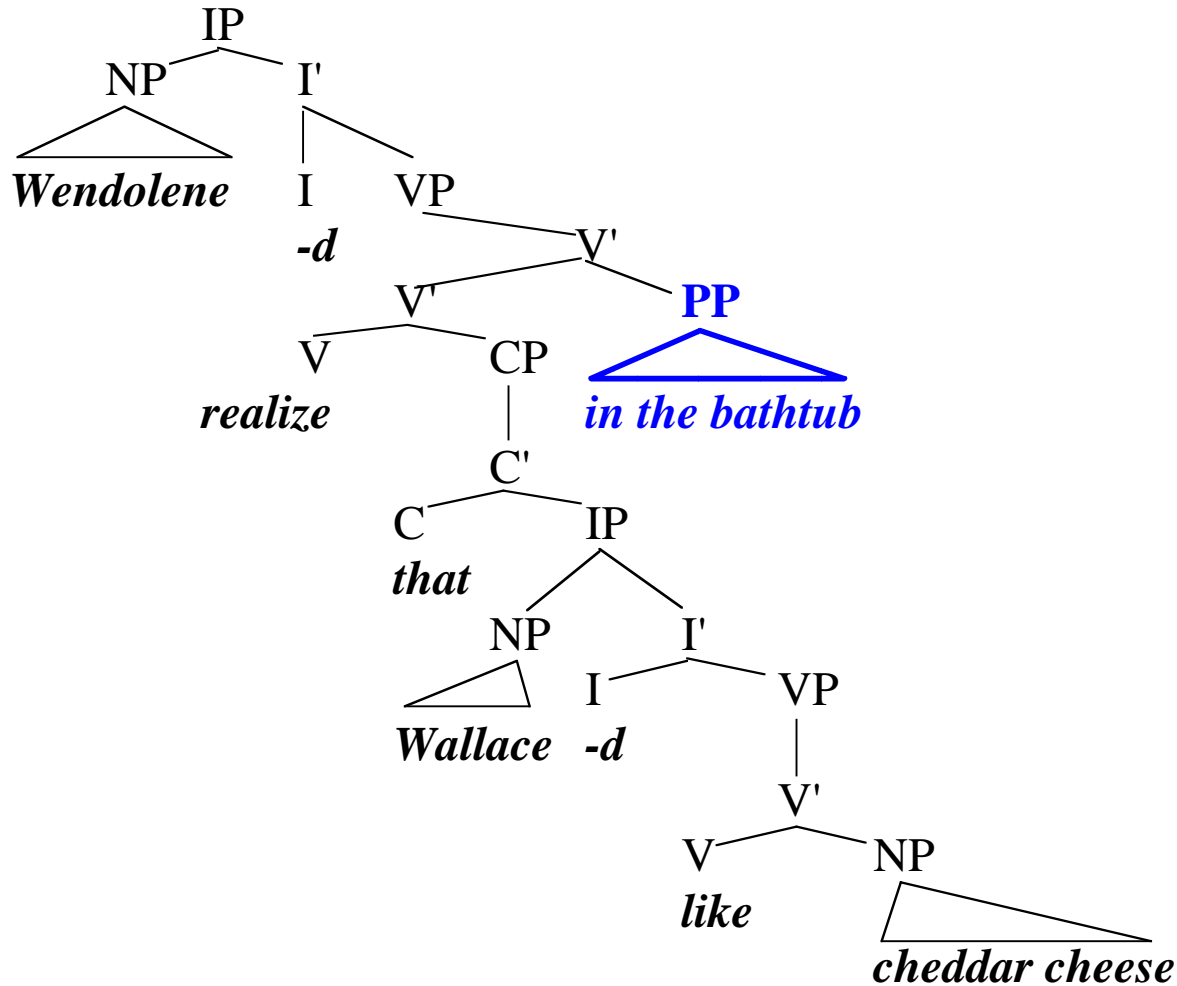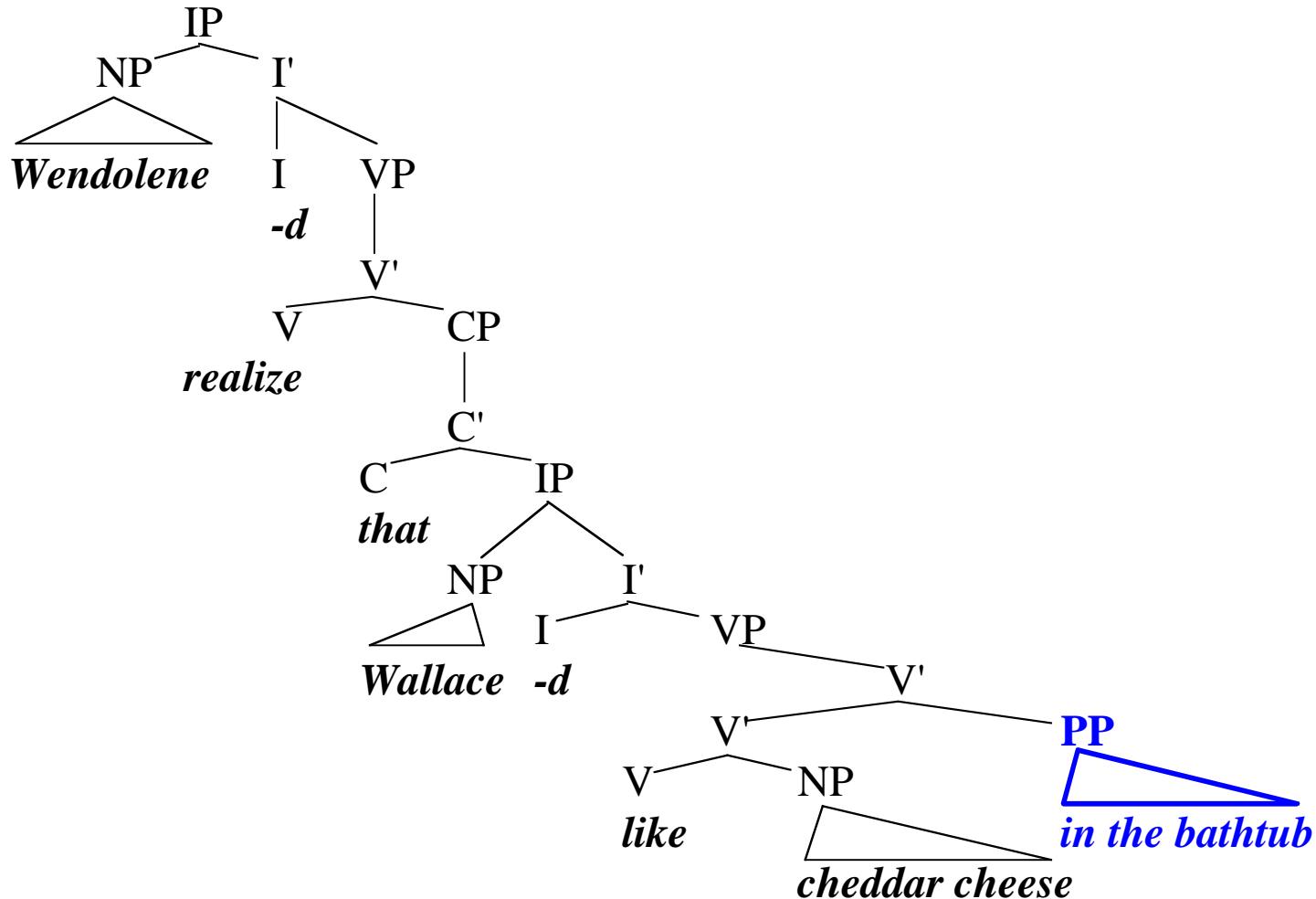
Wendolene realized that Wallace liked cheddar cheese in the bathtub.

Wendolene realized that Wallace liked cheddar cheese in the bathtub.

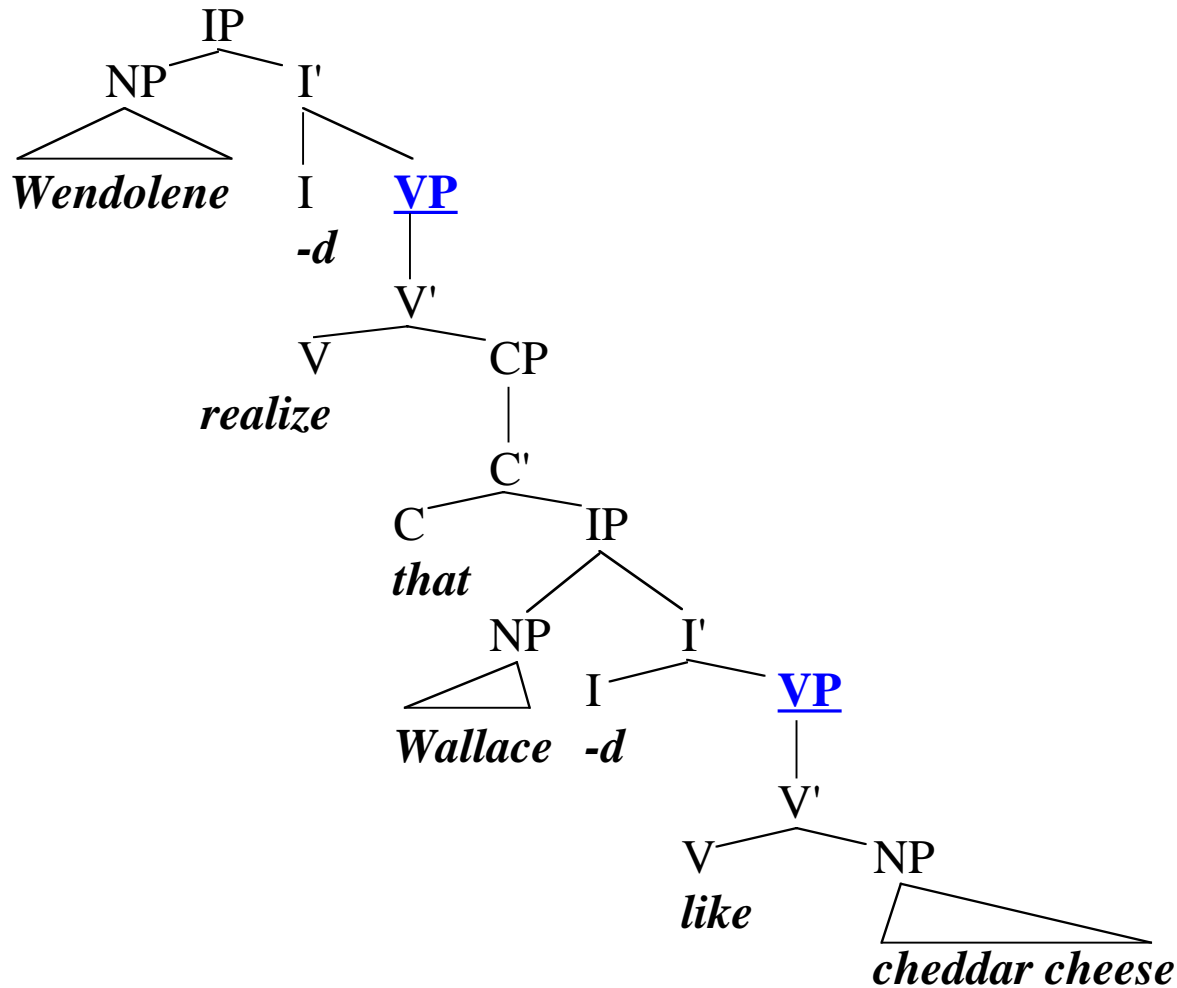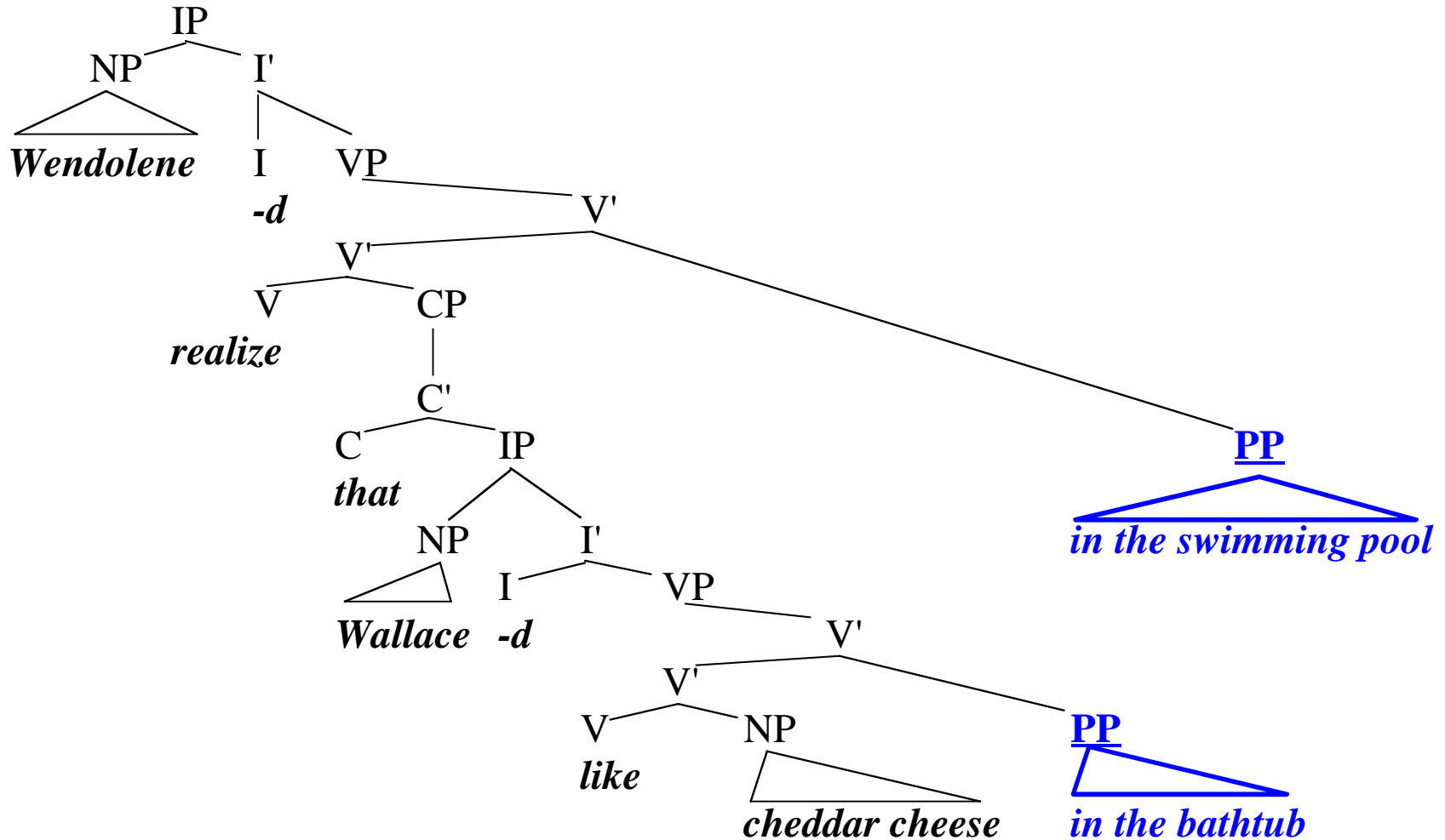# Wendolene realized that Wallace liked cheddar cheese in the bathtub.

Wendolene realized that Wallace liked cheddar cheese in the bathtub.

```
                    IP
          NP                 I'
       /‾‾‾‾‾\           |
      Wendolene       I    VP
                     -d    /‾‾\
                           V'        V'
                        /‾‾\       /‾‾\
                       V    CP    PP
                    realize  |   /‾‾‾‾‾\
                            C'   in the bathtub
                          /‾‾\
                         C    IP
                       that  /‾‾\
                           NP     I'
                        /‾‾\   /‾‾\
                       Wallace I  VP
                              -d   |
                                   V'
                                 /‾‾\
                                V    NP
                               like  /‾‾\
                                   cheddar cheese
```

Wendolene realized that Wallace liked cheddar cheese in the bathtub.

Wendolene realized that Wallace liked cheddar cheese **in the bathtub** **in the swimming pool**

Wendolene realized that Wallace liked cheddar cheese **in the bathtub** **in the swimming pool**

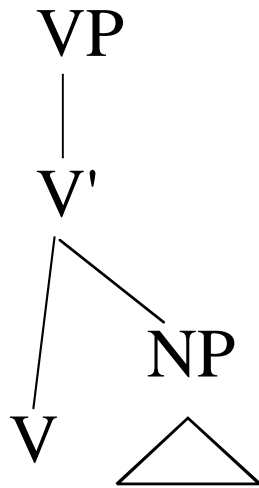# Wendolene realized that Wallace liked cheddar cheese **in the bathtub in the swimming pool**

```
                        IP
                   NP         I'
                  /  \       /  \
              Wendolene      I    VP
                            -d      \
                                     V'
                                   /    \
                                 V'      V'
                                /  \        \
                               V    CP        \
                            realize   \         \
                                      C'          \
                                    /    \          \
                                   C      IP          PP
                                 that    /  \      in the swimming pool
                                       NP    I'
                                      /  \   |  \
                                  Wallace  I    VP
                                          -d      \
                                                   V'
                                                 /    \
                                               V'      PP
                                             /   \    in the bathtub
                                            V     NP
                                          like  cheddar cheese
```
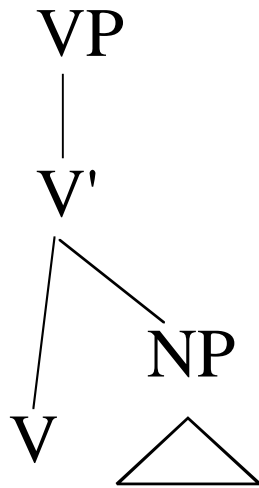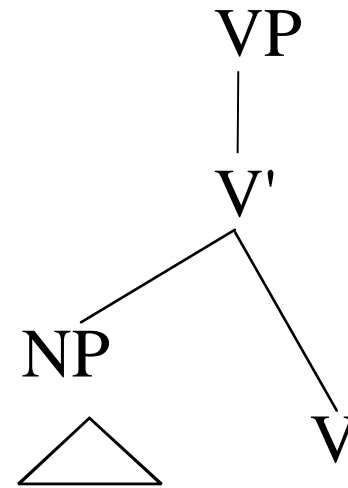
English, Japanese:

VP:

```
        VP
        |
        V'
       / \
      /   NP
     V    △
```

John [ate nattoo].

English, Japanese:

VP:

VP

V'

V NP

John [ate nattoo].

VP

V'

NP V

John-wa [nattoo-o tabeta].

English, Japanese:

VP:

	V	NP

John [ate nattoo].   John-wa [nattoo-o tabeta].

NP   V

PP:

```
            PP
            |
            P'
           / \
          /   NP
         P    △
```

Mary went [to Tokyo].

English, Japanese:

VP:

V NP

John [ate nattoo].

NP V

John-wa [nattoo-o tabeta].

PP:

PP

P'

NP

P △

Mary went [to Tokyo].

PP

P'

NP

△ P
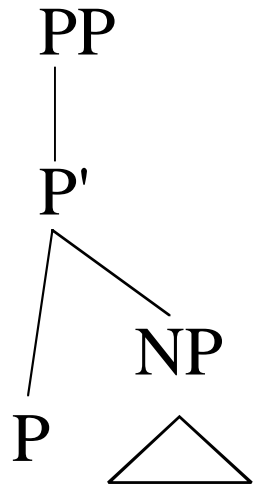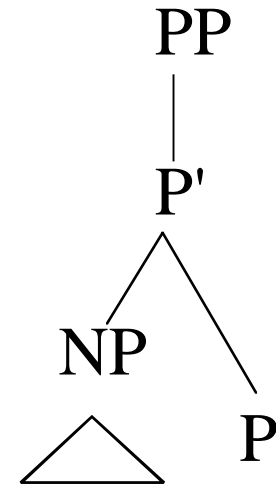
Mary-wa [Tookyoo e] itta.

English, Japanese:

VP:

      V   NP   NP   V

John [ate nattoo].   John-wa [nattoo-o tabeta].
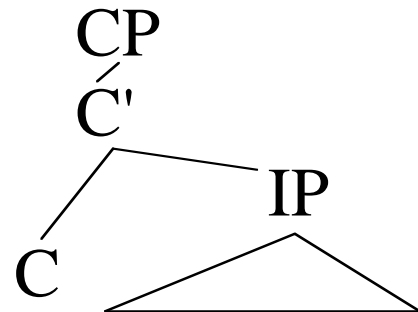
PP:

          P   NP   NP   P
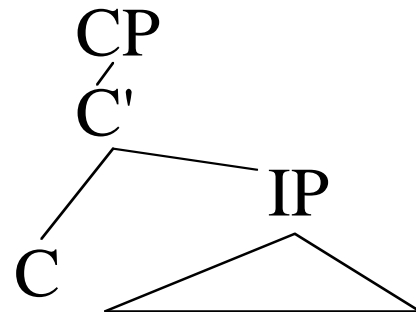
Mary went [to Tokyo].   Mary-wa [Tookyoo e] itta.

CP:

                    CP

                    C'

                        IP

           C

Bill thinks [that nattoo is tasty].

English, Japanese:

VP:

```
      V   NP                          NP      V
John [ate nattoo].              John-wa [nattoo-o tabeta].
```
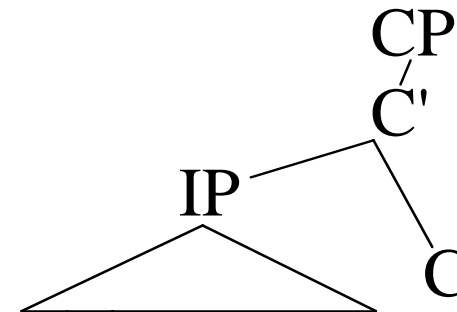
PP:

```
       P   NP                          NP    P
Mary went [to Tokyo].           Mary-wa [Tookyoo e] itta.
```

CP:

```
         CP                                CP
         |                                  |
         C'                                 C'
        /  \                               /  \
       /    \                             /    \
      C      IP                          IP     C
Bill thinks [that nattoo is tasty].   Bill-wa [nattoo-ga oishii to] omou.
```

English, Japanese:

VP:

      V   NP   NP   V

John [ate nattoo].   John-wa [nattoo-o tabeta].

PP:

         P   NP   NP   P

Mary went [to Tokyo].   Mary-wa [Tookyoo e] itta.

CP:

          C   IP   IP   C

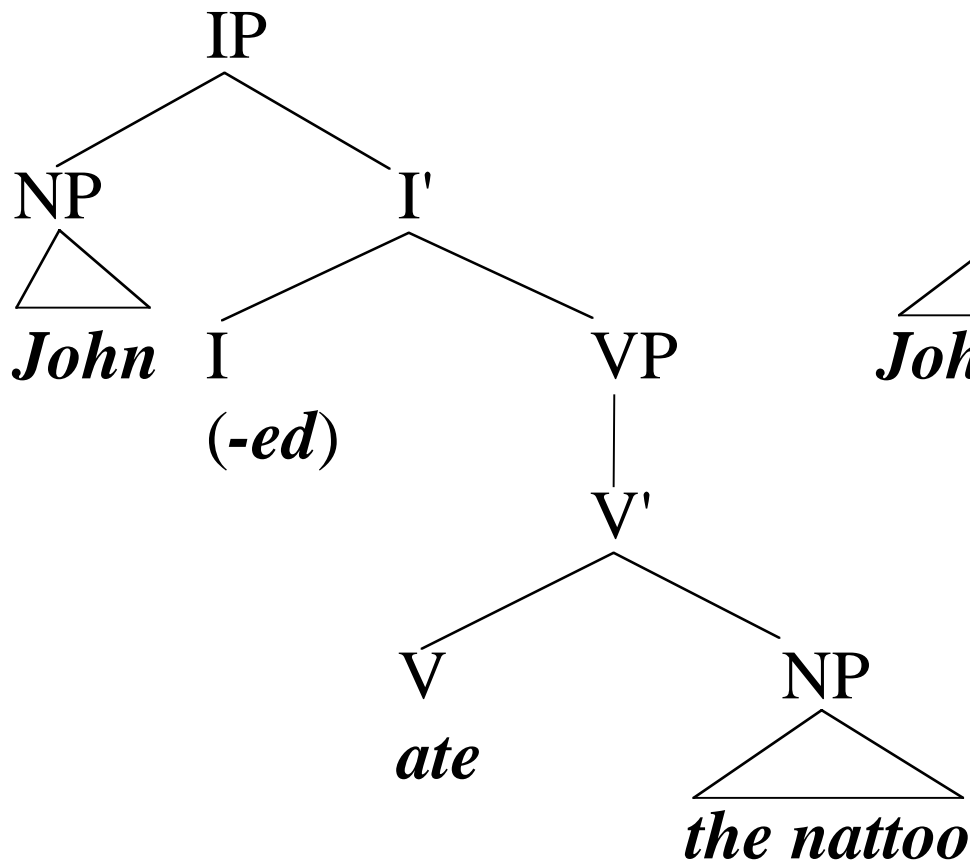Bill thinks [that nattoo is tasty].   Bill-wa [nattoo-ga oishii to] omou.

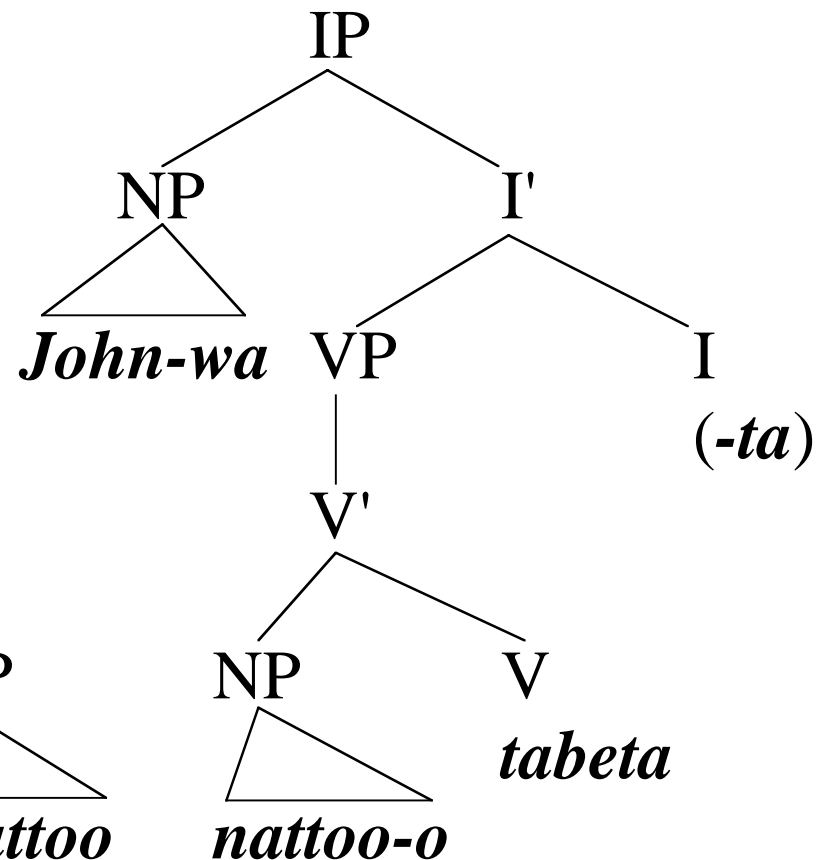| heads **precede** complements	heads **follow** complements

Head direction parameter:
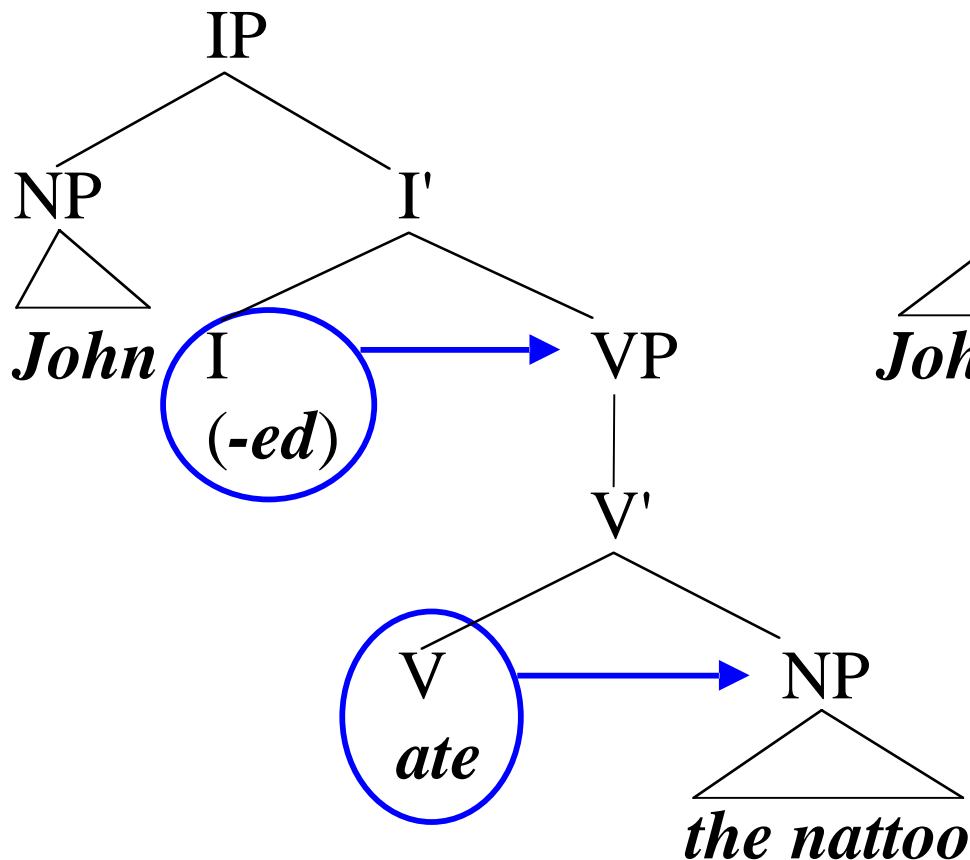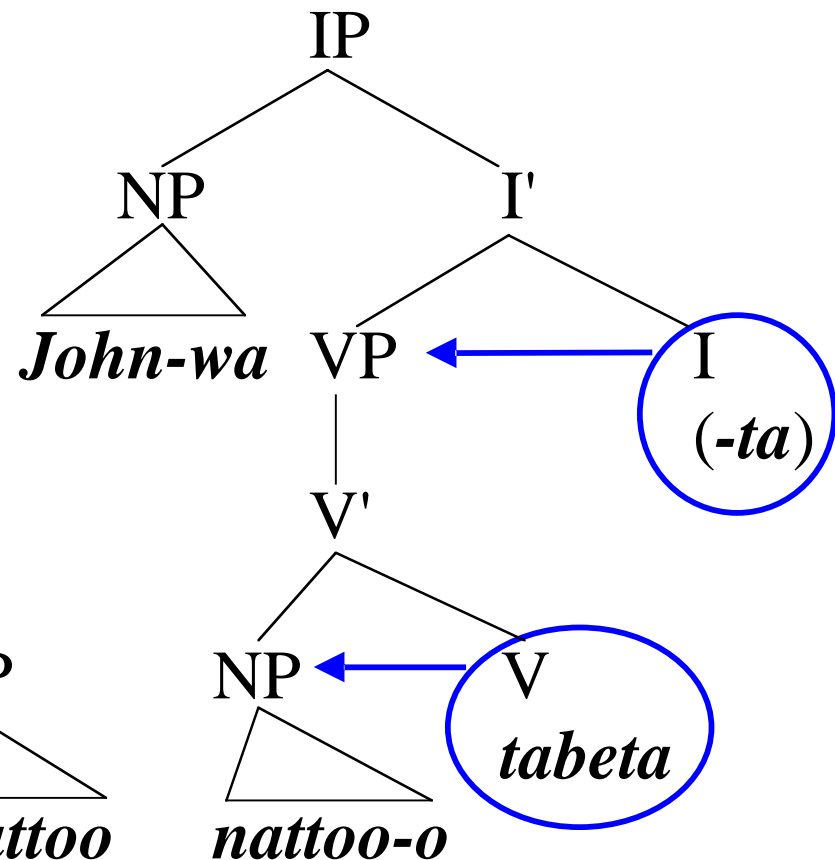Heads {precede, follow} their complements.

English: SVO

```
            IP
          /    \
        NP       I'
       / \      /  \
      /___\    I     VP
     John   (-ed)     |
                      V'
                    /    \
                   V       NP
                  ate     / \
                         /___\
                       the nattoo
```

Japanese: SOV

```
            IP
          /    \
        NP       I'
       / \      /  \
      /___\    VP    I
   John-wa    |     (-ta)
              V'
            /    \
          NP       V
         / \     tabeta
        /___\
      nattoo-o
```

Head direction parameter:
Heads {precede, follow} their complements.

English: SVO

```
          IP
         /  \
       NP    I'
       /\   /  \
     John  (I) → VP
          (-ed)   |
                  V'
                 /  \
               (V) → NP
               ate   /\
                the nattoo
```

Japanese: SOV

```
          IP
         /  \
       NP    I'
       /\   /  \
   John-wa VP ← (I)
            |   (-ta)
            V'
           /  \
         NP ← (V)
         /\  tabeta
     nattoo-o
```

Head-final languages:

VP:

             NP   V

John-wa   [nattoo-o tabeta].   'John ate nattoo' (*Japanese*)

Bkrashis-lags-gi [shabagleb mchodpared]   'Tashi ate shabagleb' (*Tibetan*)

Maana   [moosat nopna]   'The girl fed the cat' (*Hopi*)

PP:

             NP   P

Mary-wa [Tookyoo e] itta.   'Mary went to Tokyo' (*Japanese*)

Bkrashis-lags-gi [Lhasa   la] phebspared. 'Tashi went to Lhasa' (*Tibetan*)

Moosa   [maanat aw] wayma. 'The cat walks toward the girl' (*Hopi*)

Head-initial languages:

VP:

       V   NP

John [ate   hamburgers]

    [kumain   ng itlog   ] ang lalaki 'The man ate an egg' (*Tagalog*)

    [nilikuta kitabu]   'I found the book'   (*Swahili*)

PP:

              P   NP

Mary went [to Boston]

Pumunta   [sa Maynila]   si Maria   'Mary went to Manila' (*Tagalog*)

alitembea   [mpaka Dar]   'He walked to Dar' (*Swahili*)

Languages don't just differ without limit; there are patterns. Head-final/head-initial is one of the typical patterns.

(though, to be honest.....)

Back to English:

The anteater will put ants in the jar.
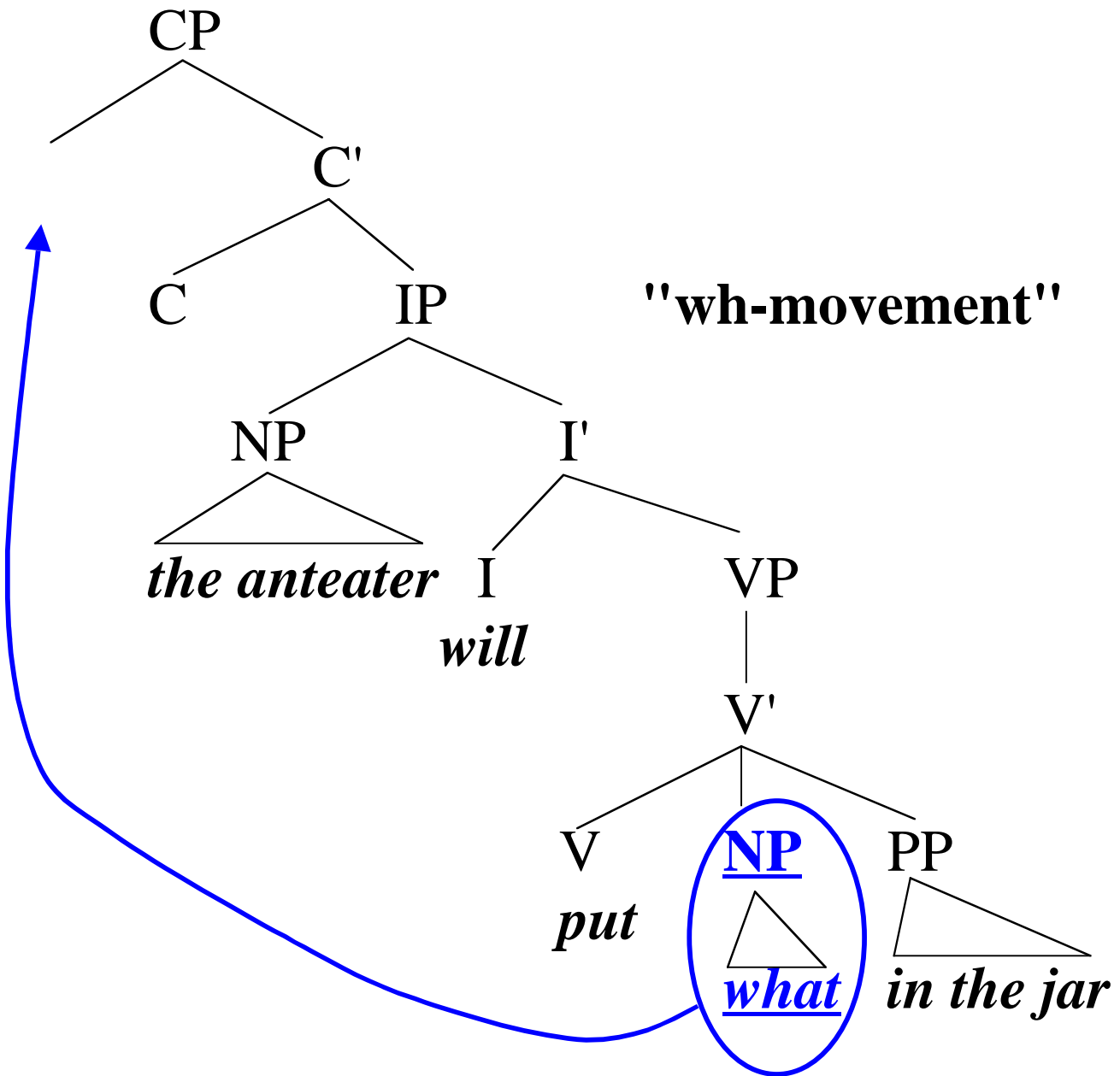*The anteater will put in the jar.
*The anteater will put ants.

I don't know
  [what the anteater will put in the jar].
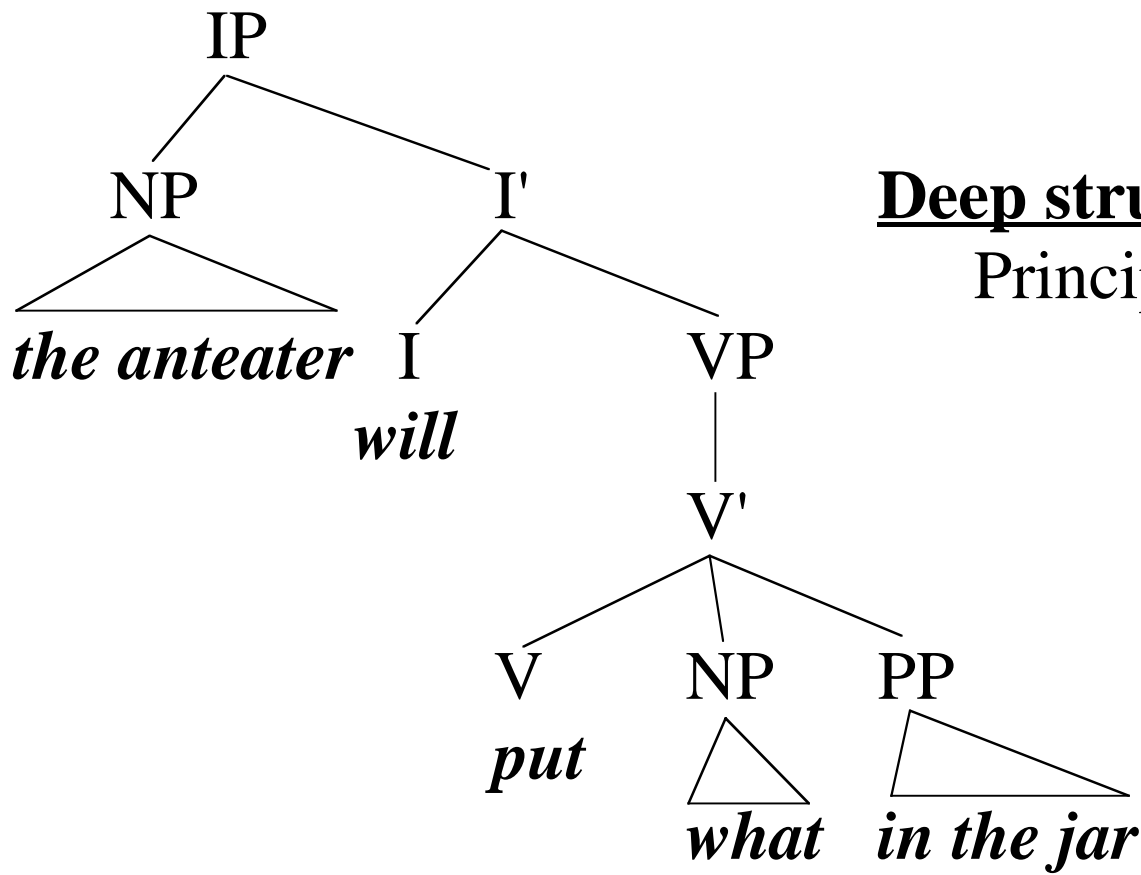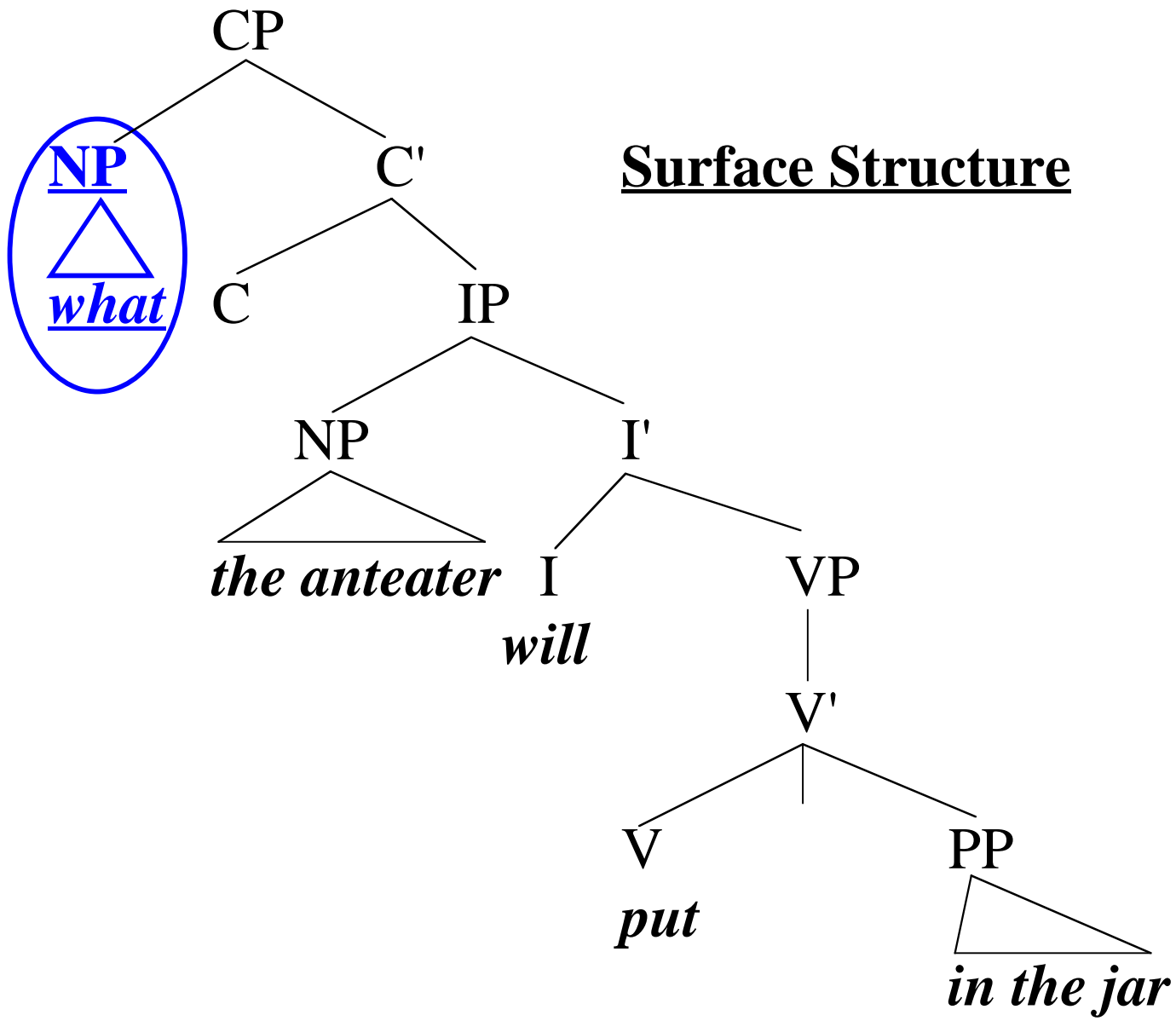
Deep structure: Projection Principle satisfied.

Surface Structure

```
                    CP
                   /  \
                 NP    C'
                /\    /  \
               /  \  C    IP
              what      /    \
                      NP      I'
                     / \     /  \
                    /   \   I    VP
            the anteater will    |
                                 V'
                                /  \
                               V    PP
                              put   / \
                                in the jar
```
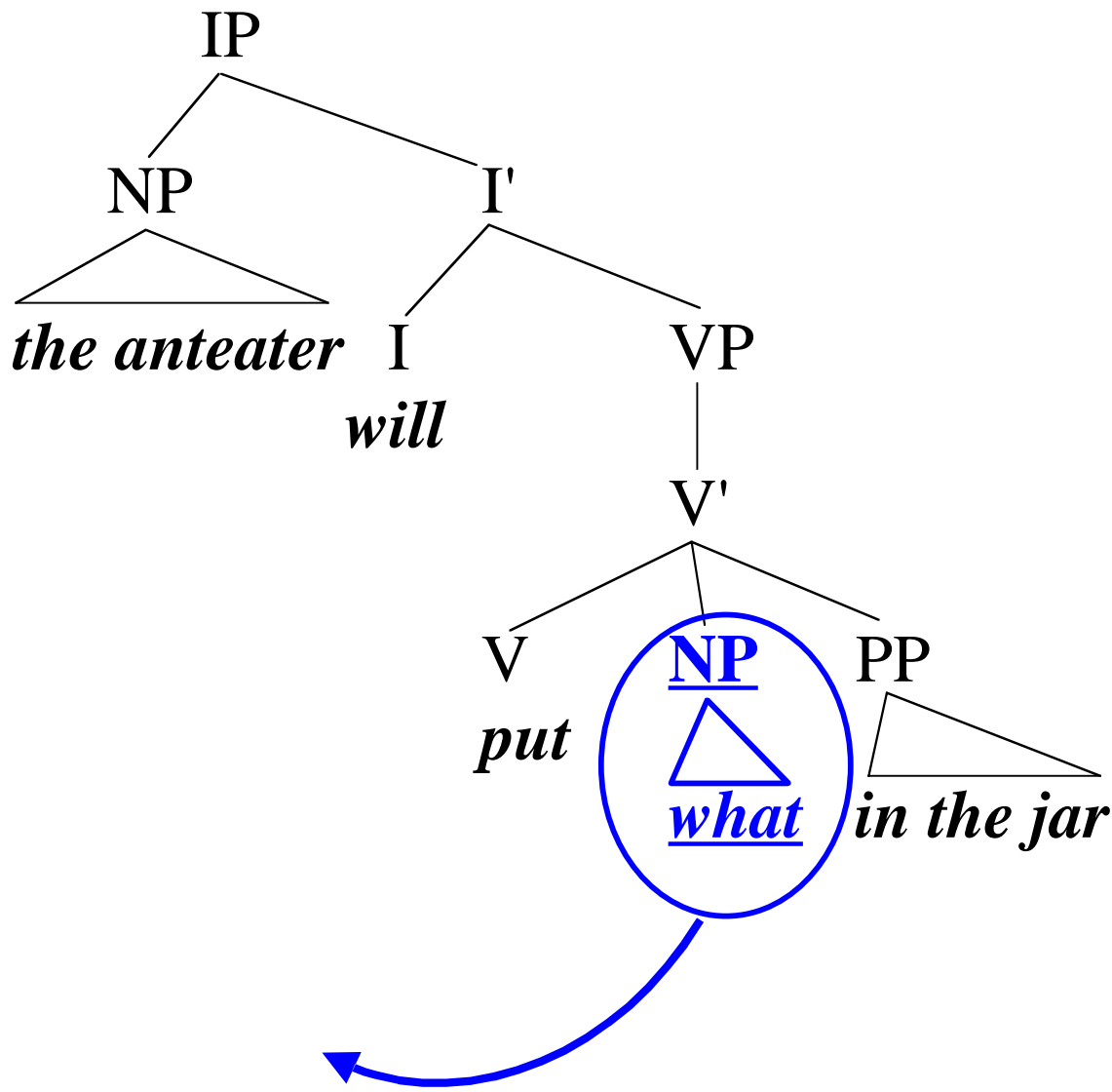
One reason to think that *what* moves into CP:

I don't know [**whether** he ate the ants]
I think   [**that** he ate the ants]

I don't know [**what** he ate]
*I don't know [**what that** he ate]
*I don't know [**what whether** he ate]

One reason to think that *what* moves into CP:

<u>Irish</u>

Bíonn fios agat i gconaí [**<u>go</u>** bhuailfidh an píobaire an t-amhrán]
be   know at-you always **<u>C</u>** will-play the piper   the song
'You always know that the piper will play the song'

Bíonn fios agat i gconaí [caidé **<u>a</u>** bhuailfidh an píobaire __]
be   know at-you always what **<u>C</u>** will-play the piper
'You always know what the piper will play'

One reason to think that *what* starts out as the complement of the verb: **West Ulster English**

What all did you give __ to the kids?
What did you give __ **all** to the kids?

Who all did you send __ to the shops?
Who did you send __ **all** to the shops?
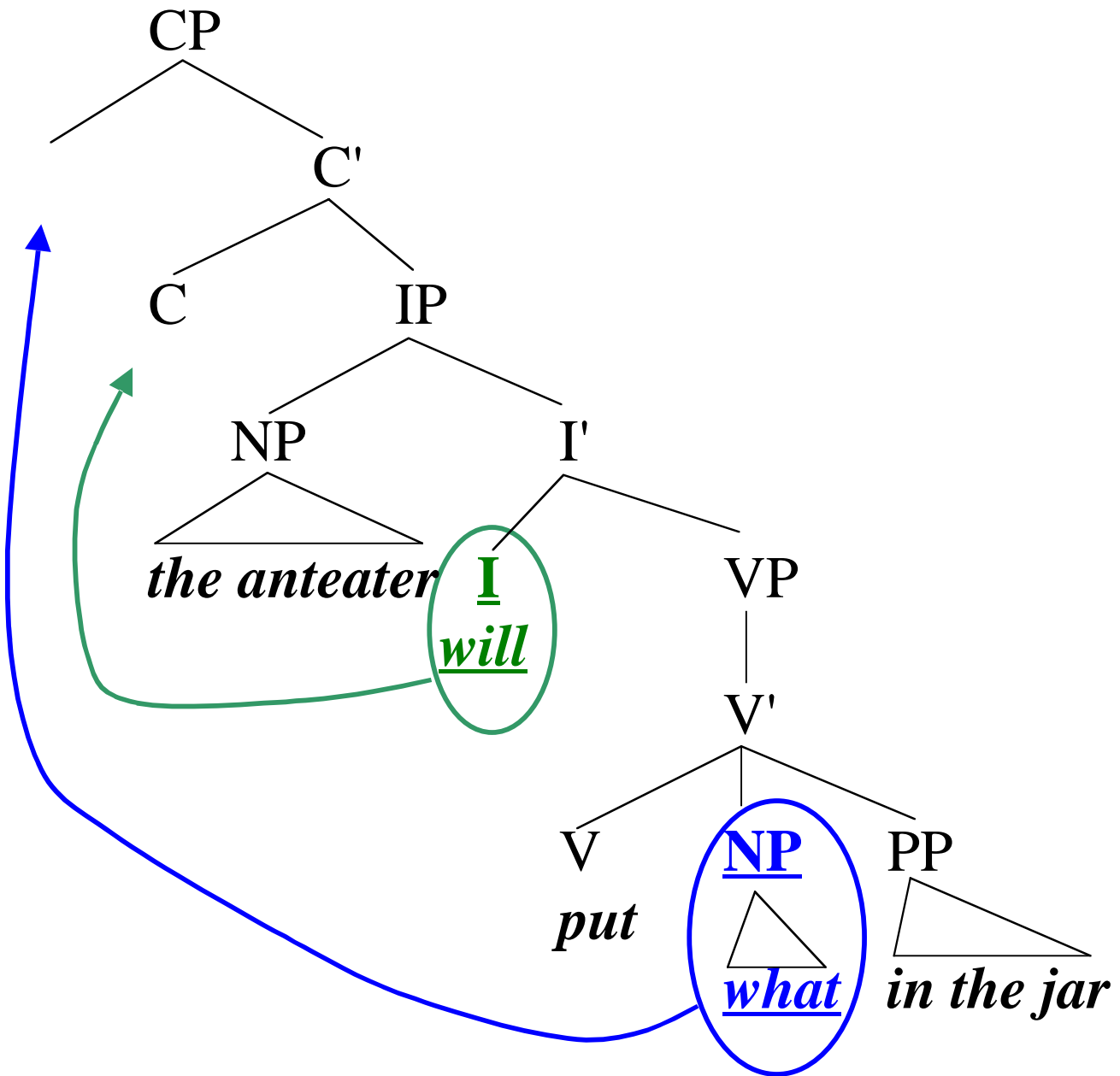
What all did you do __ after school today?
What did you do __ **all** after school today?
What did you do __ after school **all** today?
What did you do __ after school today **all**?
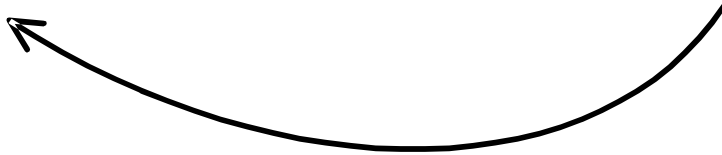
Head-movement

What will the anteater put in the jar?

```
                    CP
                   /  \
                      C'
                     /  \
                    C    IP
                        /  \
                      NP    I'
                     /|\   /  \
              the anteater  I    VP
                          (will)  |
                                  V'
                                 /  \
                                V   NP   PP
                              put  (what) in the jar
```

Deep Structure

the anteater will put what in the jar

Wh-movement

the anteater will put **what** in the jar

what the anteater will put ___ in the jar

Head-movement

what the anteater **will** put ___ in the jar

Surface Structure

what will the anteater __ put ___ in the jar

The anteater will put ants in the jar.

Will the anteater put ants in the jar?

The anteater will put ants in the jar.

Will   the anteater put ants in the jar?

The anteater **-s put** ants in the jar.

⟶ the anteater **puts** ants in the jar.

-s   the anteater put ants in the jar?

does   the anteater put ants in the jar?   **"do-support"**

| | The anteater will put ants in the jar. |
| Will | the anteater put ants in the jar? |

The anteater **-s put** ants in the jar.
⟶ the anteater **puts** ants in the jar.

-s   the anteater put ants in the jar?

↓

does   the anteater put ants in the jar?

The anteater **-d place** ants in the jar.
⟶ The anteater **placed** ants in the jar.

-d   the anteater place ants in the jar?
did   the anteater place ants in the jar?

The anteater **-d place** ants in the jar.
→ The anteater **placed** ants in the jar.

-d   the anteater place ants in the jar?
did   the anteater place ants in the jar?

The anteater **-d put** ants in the jar.
The anteater **put** ants in the jar.

-d   the anteater put ants in the jar?
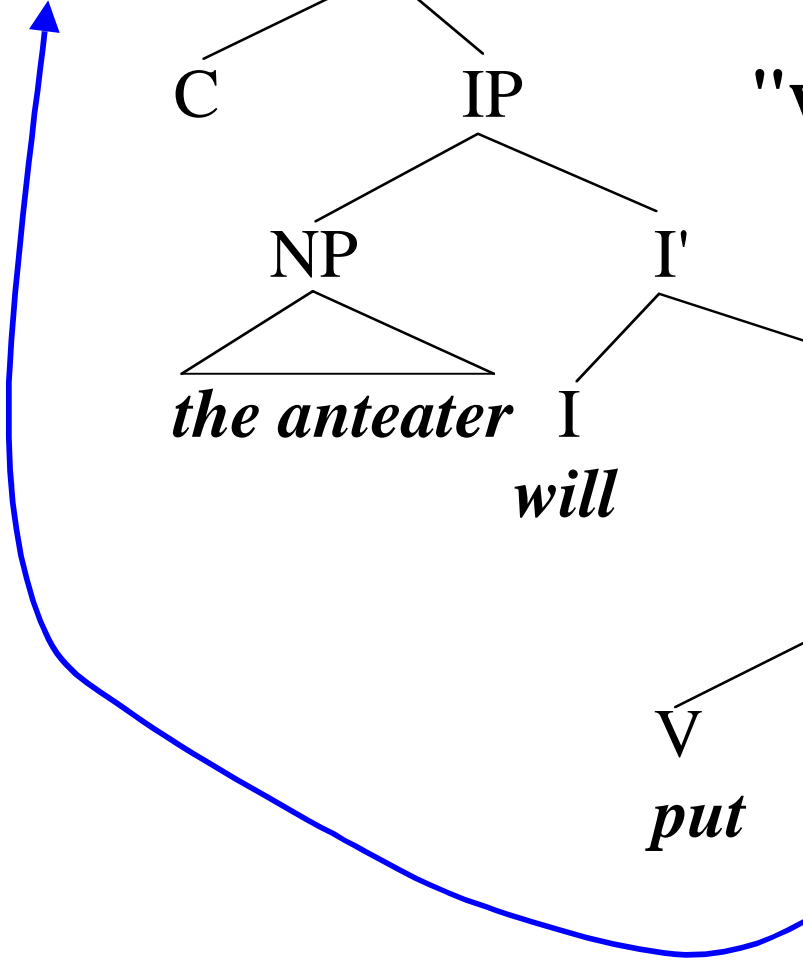**did**   the anteater put ants in the jar?

- I adjacent to the V attaches to the verb...
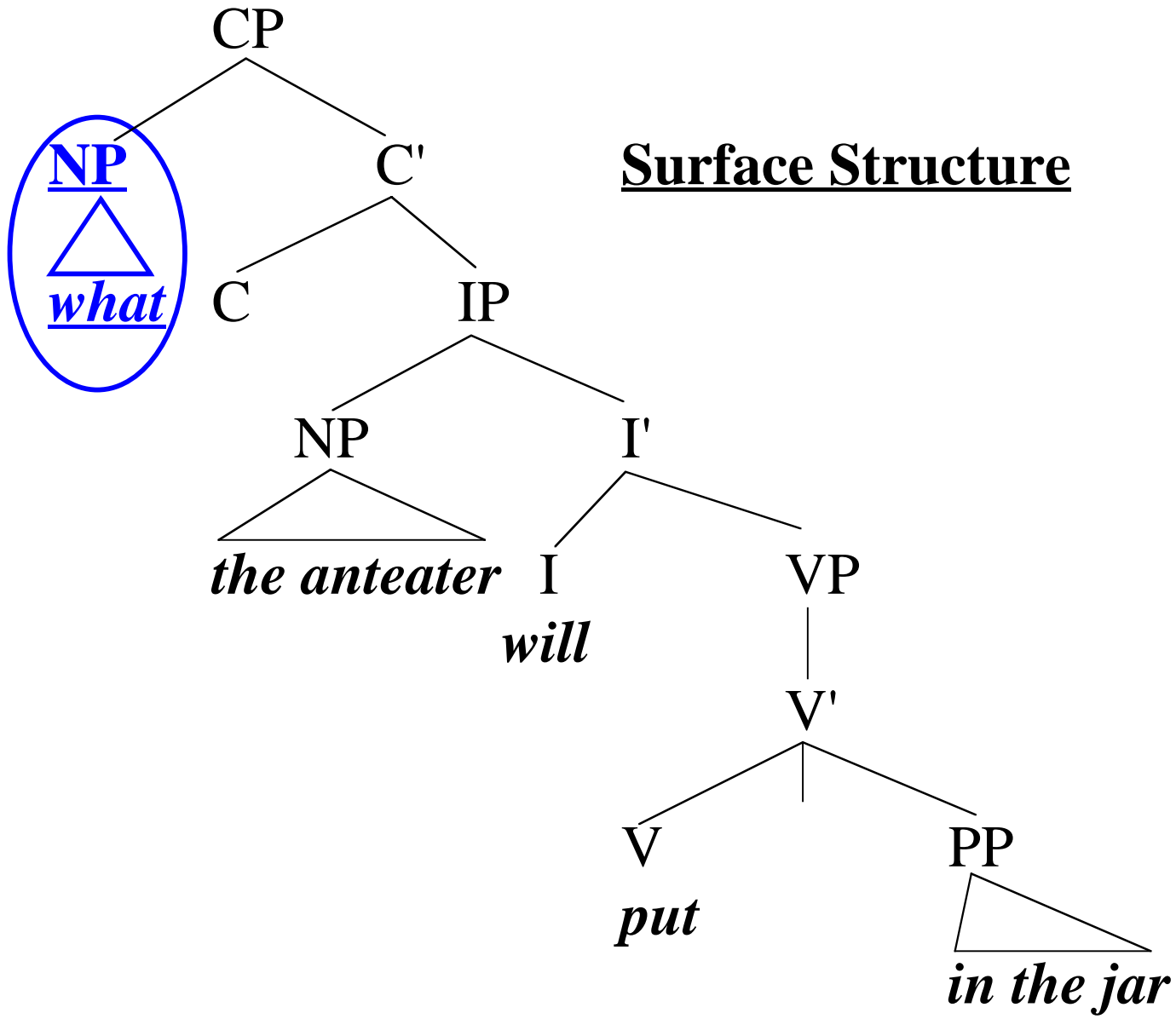 if it's not adjacent to the V, you get ***do***-support.

I don't know...

[...what the anteater will put in the jar]
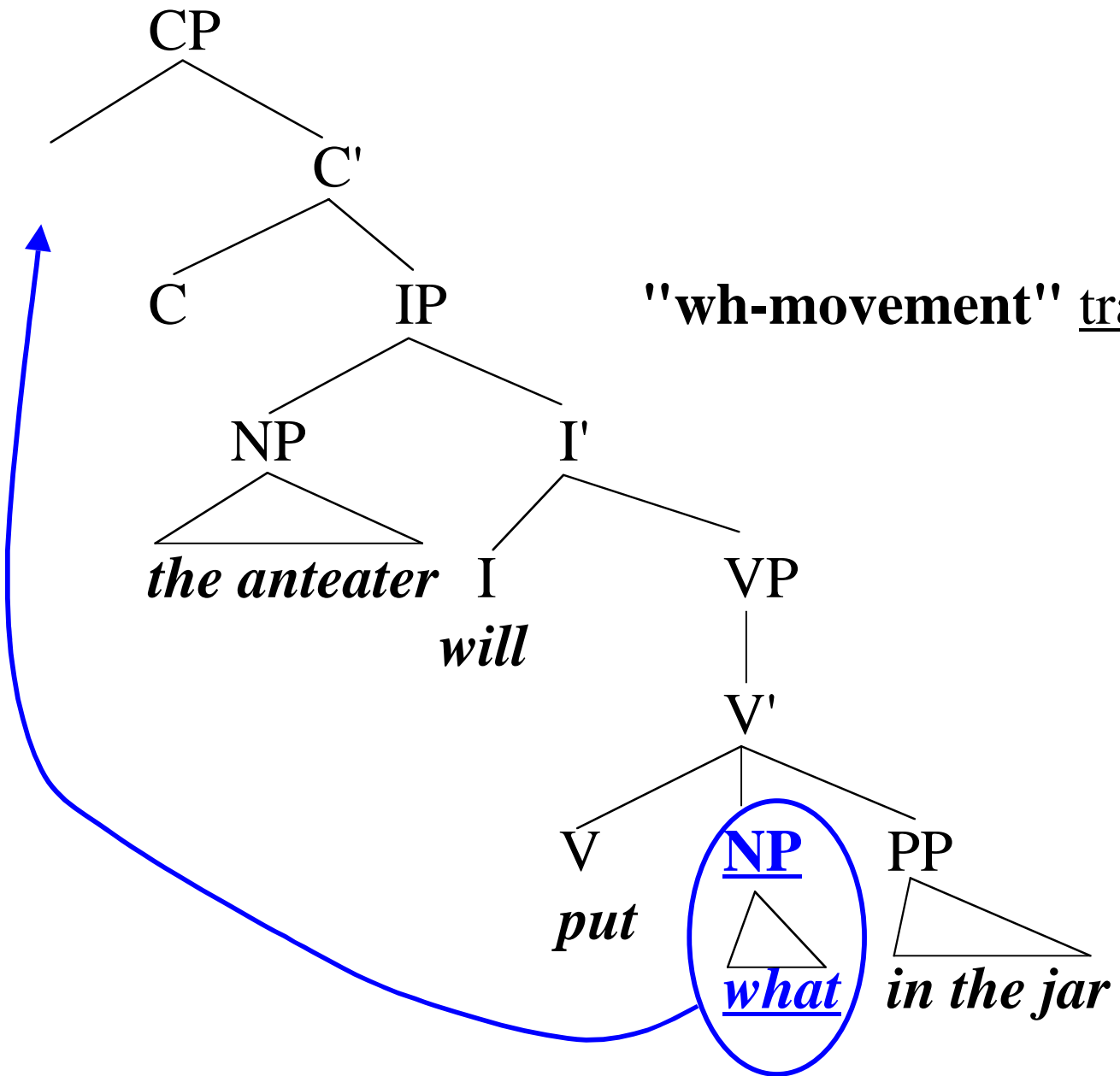
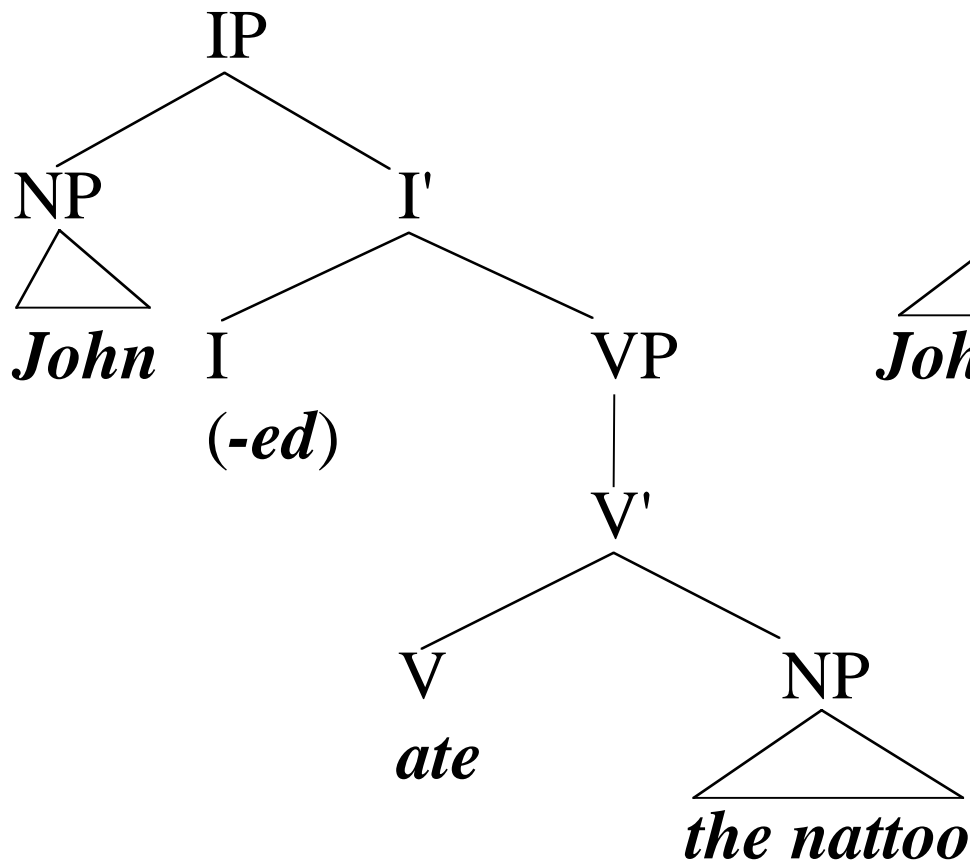**"wh-movement"** <u>transformation</u>

Surface Structure

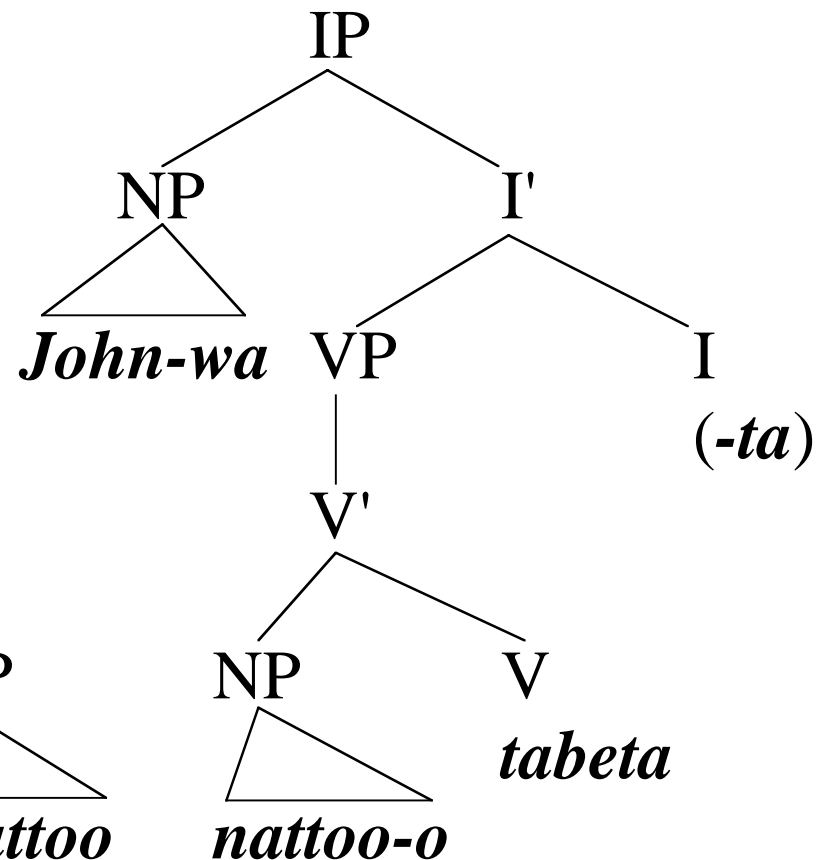**<u>Head direction parameter</u>**:
Heads {precede, follow} their complements.

Head direction parameter:
Heads {precede, follow} their complements.
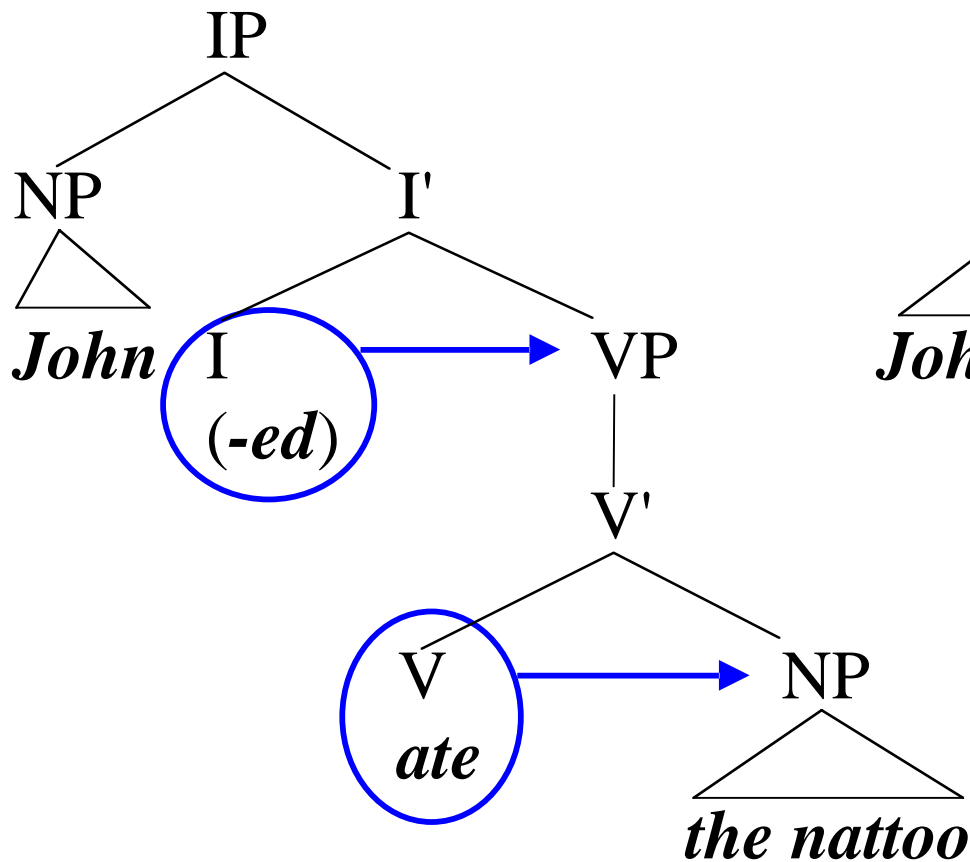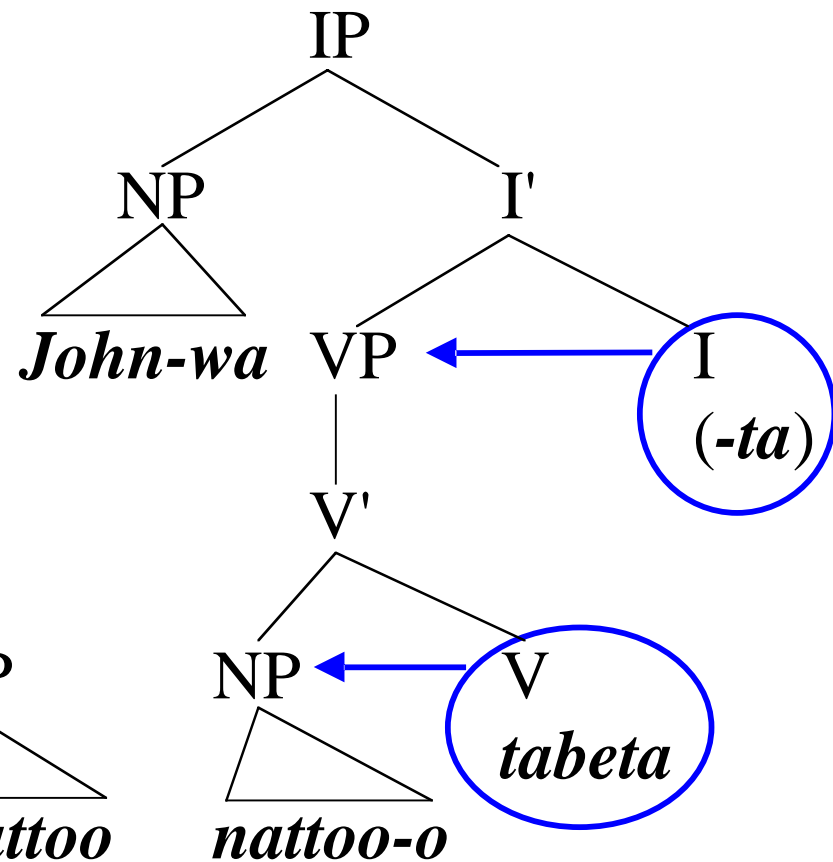
English: SVO

```
          IP
        /    \
      NP      I'
     /\      /  \
   John    I      VP
          (-ed)    |
                   V'
                  /  \
                 V     NP
                ate   /\
                    the nattoo
```

Japanese: SOV

```
          IP
        /    \
      NP      I'
     /\      /  \
  John-wa  VP      I
           |      (-ta)
           V'
          /  \
        NP     V
        /\    tabeta
     nattoo-o
```

Head direction parameter:
Heads {precede, follow} their complements.

English: SVO

```
              IP
            /    \
          NP      I'
          /\     /  \
       John  (I)    VP
           (-ed) ───►  |
                       V'
                      /  \
                    (V)──► NP
                    ate    /\
                     the nattoo
```

Japanese: SOV

```
              IP
            /    \
          NP      I'
          /\     /  \
    John-wa   VP ◄─── (I)
              |       (-ta)
              V'
             /  \
           NP ◄── (V)
           /\     tabeta
       nattoo-o
```

Notice that there is no "specifier direction parameter".

English: SVO

IP
- NP
  - *John*
- I'
  - I
    - *(-ed)*
  - VP
    - V'
      - V
        - *ate*
      - NP
        - *the nattoo*

Japanese: SOV

IP
- NP
  - *John-wa*
- I'
  - VP
    - V'
      - NP
        - *nattoo-o*
      - V
        - *tabeta*
  - I
    - *(-ta)*

Klingon: OVS

"The Klingon ate the *qaH*"
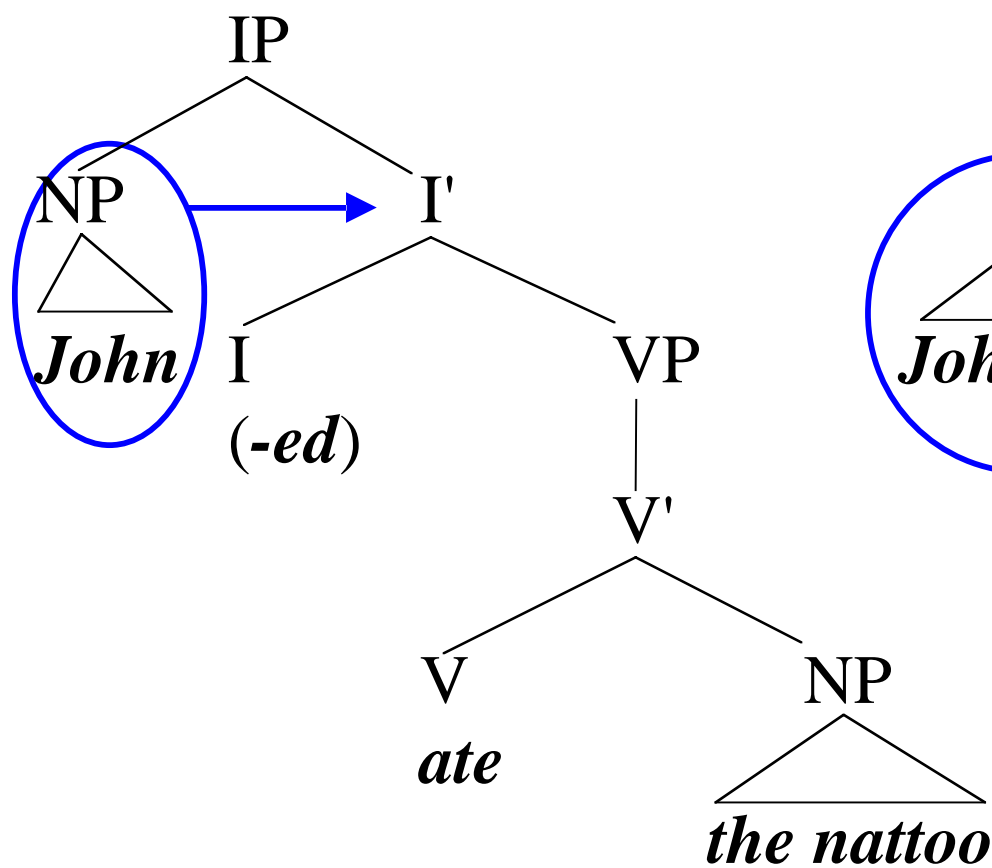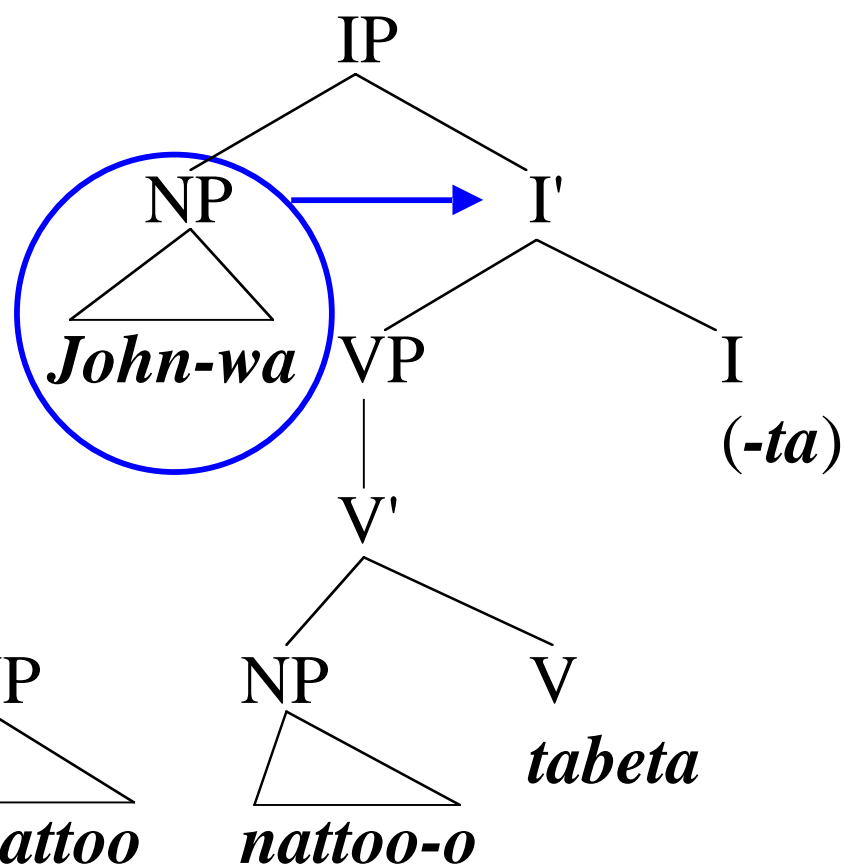
Here on Earth, OVS languages are extremely rare (though there are a few apparent examples):

Hixkaryana

Kuraha yonyhoryeno bɨyekomo
bow   **made**   **boy**
'The boy made a bow'

--> specifiers are always on the left.

There is a "head direction parameter",
but no "specifier direction parameter".

This has consequences for acquisition....

wh-movement again

What did you put __ on the table?

Ano ang inilagay mo __ sa lamesa?   [*Tagalog*]
what   put   you   on table

Mihin panen vaatteeni __ ?   [*Finnish*]
where I-put   my-clothes

wh-in-situ

Zhangsan mai-le **shenmo**?   [*Chinese*]
Zhangsan bought what
'What did Zhangsan buy?'

Suu kɨ   yuu **akə**?   [*Bafut*]
Suu TNS buy what
'What did Suu buy?'

Ya um **hakiy**   tuwa?   [*Hopi*]
Q you who-ACC found
'Who did you find?'

multiple-wh

What did you give __ **to whom**?

multiple-wh

What did you give __ **to whom**?

Kakvo na kogo e dal __ __?   [*Bulgarian*]
what   to whom he-gave

Takhróri **úhka nahótʌ** __ wa'ehnínu' __   [*Mohawk*]
tell-me   who   what   bought
'Tell me who bought what.'

wh-review:

- wh-movement is to the left.

- languages move zero, one, or all wh-phrases.

wh-review:

- wh-movement is to the left.
  (specifiers are always on the left)

- languages move zero, one, or all
  wh-phrases.

wh-review:

- wh-movement is to the left.
  (specifiers are always on the left)

- languages move zero, one, or all
  wh-phrases.
  (language cannot count)

some imaginable but unattested languages:

- wh-movement to the right

__ bought the mango **who**?

- movement of up to two wh-phrases

who what __ gave __ **to whom**?

Logical problem of language acquisition

$f(1)=1$
$f(2)=2$
$f(3)=3$
$f(4)=4$
$f(5)=??$

Logical problem of language acquisition

$f(1)=1$
$f(2)=2$
$f(3)=3$
$f(4)=4$
$f(5)=$**29**

$f(n)=(n-1)(n-2)(n-3)(n-4) + n$

acquisition of wh-strategies

<u>Kakvo</u> <u>na kogo</u>   e   dal ___ ___?   [*Bulgarian*]
what   to whom he-gave
'What did he give to whom?'

acquisition of wh-strategies

Kakvo na kogo e dal __ __?   [*Bulgarian*]
what   to whom he-gave
'What did he give to whom?'

- move all wh-phrases?
- move two wh-phrases?
- move up to three wh-phrases?
- move up to four wh-phrases?
    ...

acquisition of wh-strategies

Kakvo na kogo e dal __ __? [*Bulgarian*]
what to whom he-gave
'What did he give to whom?'

- **move all wh-phrases**
- ~~move two wh-phrases?~~
- move up to three wh-phrases?
- move up to four wh-phrases?
  ...

acquisition of wh-strategies

Zhangsan mai-le **shenmo**?   [*Chinese*]
Zhangsan bought what
'What did Zhangsan buy?'

acquisition of wh-strategies

Zhangsan mai-le **shenmo**?   [*Chinese*]
Zhangsan bought what
'What did Zhangsan buy?'

- wh-in-situ?
- move wh-phrase to the right?
- make wh-phrase the third word?

    ....

acquisition of wh-strategies

Zhangsan mai-le **shenmo**?   [*Chinese*]
Zhangsan bought what
'What did Zhangsan buy?'

- **wh-in-situ**
- move wh-phrase to the right?
- make wh-phrase the third word?
    ....